ENGINEERING DEPARTMENT

ADDENDUM TO THE CONTRACT

for the

Salmon Creek Water Filtration Plant
Contract No. E15-224

ADDENDUM NO.: **ONE**

CURRENT DEADLINE FOR BIDS:
June 25, 2015

PREVIOUS ADDENDA: **NONE**

ISSUED BY:

City and Borough of Juneau
ENGINEERING DEPARTMENT
155 South Seward Street
Juneau, Alaska 99801

DATE ADDENDUM ISSUED: **June 2, 2015**

The following items of the contract are modified as herein indicated. All other items remain the same. This addendum has been issued and is posted online. Please refer to the CBJ Engineering Contracts Division webpage at: http://www.juneau.org/engineering_ftp/contracts/Contracts.php

PROJECT MANUAL:

Item No. 1 ***Add*** Attachment No. 1 Contract E15-065 Supply and Installation Assistance Salmon Creek Water Plant Membrane Filters with Pall Corporation and Attachment No. 2 Change Order No. 1 to Contract E15-065 Supply and Installation Assistance Salmon Creek Water Plant Membrane Filters with Pall Corporation. These attachments were left out of the hard copy of the bid documents, they were provided to the online version. The two attachments are referred to in the Table of Contents and SECTION 13600 – Membrane Filters.

By: _____
Greg Smith,
Contract Administrator

Total number of pages contained within this Addendum: 56

Contract No. RFP E15-065
Supply and Installation Assistance
Salmon Creek Water Plant Membrane Filters

TABLE OF CONTENTS

- **Contract**
- **Appendix A Scope of Services**
- **Appendix A Scope of Services - *Attachment 1 - 3.0 Scope of Services;***
- **Appendix A Scope of Services - *Attachment 2 - Membrane Filtration System Specifications;***
- **Appendix A Scope of Services - *Attachment 3 - List of Spare Parts;***
- **Appendix A Scope of Services - *Attachment 4 -Warranty;***
- **Appendix A Scope of Services - *Attachment 5 - Project Schedule;***
- **Appendix B Compensation**
- **Appendix C Insurance**
- **Appendix D Performance Bond**
- **Appendix E State of Alaska department of Environmental Conservation State Drinking Water Loan Program**
- **Appendix F Alaska Labor Standards, Reporting and Prevailing Wage Rate Determination**

ENGINEERING DEPARTMENT

Contract No. RFP E15-065
Supply and Installation Assistance
Salmon Creek Water Plant Membrane Filters

This Agreement is entered into by and between the City and Borough of Juneau, Alaska ("City"), and Pall Corporation whose address is 25 Harbor Park Drive, Port Washington, New York phone 516-484-5400 ("Consultant").

Witnesseth:

Whereas, the City desires to engage the Consultant for the purpose of rendering certain professional services, and

Whereas, the Consultant represents that it is in all respects licensed and qualified to perform such services;

Now, Therefore, the parties agree as follows:

1. CONTRACTUAL RELATIONSHIP. The parties intend that an independent Consultant/City relationship will be created by this Contract. City is interested only in the results to be achieved, and the conduct and control of the work will lie solely with the Consultant. Consultant is not considered to be an agent or employee of City for any purpose, and the employees of Consultant are not entitled to any benefits that City provides for City's employees. It is understood that the City does not agree to use the Consultant exclusively. It is further understood that the Consultant is free to contract for similar services to be performed for others while it is under contract with the City.

2. SCOPE OF SERVICE. The Consultant shall carry out in a professional and prudent manner all of the services required by the Contract. These services include all of the services described in RFP Documents. Consultant will diligently proceed with the Scope of Services, and will provide such services in a timely manner.

3. PERSONNEL, EQUIPMENT, SUPPLIES, AND LICENSES.

(A) Except as noted in RFP Documents, the Consultant represents that it has or will secure at its own expense all personnel, equipment, and supplies required in performing the services under this Contract.

(B) All of the services required hereunder will be performed by the Consultant or under its supervision.

(C) None of the work or services covered by this Contract shall be subcontracted without prior written approval of the Contract Administrator.

(D) Consultant warrants that it is fully licensed under all applicable local, state, and federal laws to perform the services to be provided hereunder.

4. TIME OF PERFORMANCE. The services of the Consultant are to commence after the execution of the Contract and issuance of Notice to Proceed. All work shall be completed no later than the time specified in RFP Documents. Amendment to this Contract may be made upon mutual, written agreement prior to the contract expiration date.

5. REPORTING. Except as authorized within RFP Documents, the City's primary representative for this Contract shall be Alan Steffert, P.E. The City Manager shall be an alternate representative. The City shall not be liable for Consultant's expenses incurred in reliance on directions received from any other municipal officer or employee. The Consultant's representative shall be Terry Cowley.

6. COMPENSATION. The City agrees to pay the Consultant according to the schedule attached as Appendix B. The Consultant's estimated fee schedule is attached to Appendix B.

7. TERMINATION OF CONTRACT FOR CAUSE. If, through any cause, except causes beyond the control of the Consultant, the Consultant shall fail to fulfill in a timely and proper manner its obligations under this Contract; or if the Consultant shall violate any of the covenants, agreements, or stipulations of this Contract, the City shall have the right to terminate this Contract by giving written notice to the Consultant of such termination and specifying the effective date thereof, provided the defaulting party is given at least 30 days to cure. In that event, all finished or unfinished documents, or other data, in whatever form, prepared by the Consultant under this Contract shall, at the option of the City, become its property, and the Consultant shall be entitled to receive just and equitable compensation for any satisfactory work completed on such documents and materials, not to exceed the Contract amount.

8. TERMINATION FOR CONVENIENCE OF CITY. The City may terminate this Contract at any time by giving written notice to the Consultant of such termination and specifying the effective date thereof, at least thirty days before the effective day of such termination. In that event, all finished or unfinished documents and other materials as described in paragraph 7 above shall, at the option of the City become its property, and the Consultant will be paid for all costs incurred up to and until the termination date, plus overhead and a reasonable profit.

9. CONTRACT AGREEMENT. All parties mutually agreed to the terms of this Contract. The Contract should not be construed in favor of or against any party. This Contract contains the entire agreement between the parties; there are no other promises, terms, conditions, or obligations other than those contained herein; and this Contract shall supersede all previous communications, representations or agreements, either oral or written, between the parties.

10. CHANGES. The City may, from time to time, require changes in the scope of services to be performed under this Contract. Such changes, including any increase or decrease in the amount of the Consultant's compensation, must be mutually agreed upon in writing before they will be regarded as part of this Contract.

11. EQUAL EMPLOYMENT OPPORTUNITY. The Consultant will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin.

12. CONFLICTS OF INTEREST. Consultant agrees that no employee of the City who has exercised or will exercise any authority over the specifications, procurement, supervision or payment for this Contract, and no member of the employee's immediate family, has had or will have any direct or indirect financial interest in this Contract. If the Consultant learns of any such

interest, the Consultant shall without delay inform the City Attorney or one of the officers specified in Paragraph 5.

13. ETHICS. Consultant shall discharge its duties fairly, impartially and maintain a standard of conduct that competently serves the City and the interests of the City. Consultant shall at all times exercise unbiased judgment when performing its duties under this contract.

14. PUBLIC RELATIONS. Consultant shall issue press releases, respond to press inquiries, make public speeches, appear on broadcast media or otherwise engage in public relations regarding the project only with the specific approval of the CBJ Project Manager.

15. ELECTED OFFICIALS. The Consultant shall respond to project-related inquiries from elected officials by providing impartial, factual information, but shall not initiate contact or attempt to persuade an elected official to agree with any viewpoint or to take any official action. The Consultant will promptly notify the Project manager of any request by an elected official for project-related information.

16. ASSIGNABILITY. The Consultant shall not assign any interest in this Contract and shall not transfer any interest in the same without the prior written consent of the City; however, claims for money due or to become due to the Consultant from the City under this Contract may be assigned to a bank, trust company, or other financial institution without approval. Notice of any such assignment or transfer shall be furnished promptly to the City.

17. FINDINGS CONFIDENTIAL. Any information given to or prepared by the Consultant under this Contract which the City requests to be kept as confidential shall not be made available to any individual or organization by the Consultant without the prior written approval of the City.

18. IDENTIFICATION OF DOCUMENTS. All reports, maps, and other documents completed as a part of this Contract, other than documents exclusively for internal use within the City, shall carry a City notation or logo as directed by the City.

19. PUBLICATION, REPRODUCTION AND USE OF MATERIALS AND SOFTWARE. The Consultant hereby grants to City ("Licensee"), a non-exclusive, non-transferable, royalty-free license, with the right to sublicense, to use Consultant's documents, drawings, reports and data ("Consultant's Materials") and software owned and provided by Consultant ("Consultants Software") but only in connection with installation, operation, maintenance, and regulatory approval of the equipment and components ("System") purchased hereunder, at the stated Project location and for the purpose defined by the Contract documents.

Such license does not extend to the re-creation or duplication of the System, in whole or in part. Licensee shall not create derivative works from the Consultants Materials or Consultants Software. Licensee acknowledges and agrees that there is no transfer of title or ownership of the Consultant's Materials or Consultant's Software.

Except as required by law, or as required to facilitate System regulatory approval, installation, proper operation, or maintenance, Licensee agrees not to reproduce or distribute Consultant's Materials. If Consultant's Materials are reproduced as authorized herein, Licensee shall not remove any Consultant's copyright markings nor remove ownership markings of Consultant.

Licensee further agrees not to translate, reverse engineer, decode, alter, modify, copy, distribute or reproduce Consultant's Software unless authorized in writing by Consultant.

20. RECORDS. During performance and after termination of this Contract, each party shall make available to the other party for inspection and copying, all records, excluding financial information, relative to the project.

21. INSURANCE REQUIREMENTS. Contractor has secured and agrees to keep and maintain in full force and effect, at its own expense, the insurance approved by CBJ Risk Management as outlined in Appendix C. All insurance required under this contract shall name the CBJ as an additional insured, except with respect to any required Professional Liability or Workers Compensation policies. At least 30 days prior to the cancellation, non-renewal or reduction in the amount of coverage, Contractor shall provide written notice to the CBJ's Risk Management. The Contractor's insurance shall be primary and any insurance maintained by the CBJ shall be non-contributory. If the Contractor maintains higher limits than shown below, the CBJ shall be entitled to coverage for the higher limits maintained by the Contractor. Failure of CBJ to demand such certificate or other evidence of full compliance with these insurance requirements or failure of CBJ to identify a deficiency from evidence that is provided shall not be construed as a waiver of the obligation of the Contractor to maintain the insurance required by this contract.

22. INDEMNIFICATION AND HOLD HARMLESS. The Consultant agrees to defend, indemnify, and hold harmless CBJ, its employees, and authorized representatives, with respect to any third party action, claim, or lawsuit to the extent caused by the Consultant's negligent performance of this contract without limitation as to the amount of fees, and without limitation as to any damages, cost or expense resulting from settlement, judgment, or verdict, and includes the award of any attorney's fees even if in excess of Alaska Civil Rule 82. This indemnification agreement applies to the fullest extent permitted by law, meaning that if there is a claim of, or liability for, a joint act, error, or omission of the consultant and the CBJ, the indemnification, defense, and hold harmless obligation of this provision shall be apportioned on a comparative fault basis. This agreement is in full force and effect whenever and wherever any action, claim, or lawsuit is initiated, filed, or otherwise brought against CBJ relating to this contract. The obligations of Consultant arise immediately upon actual notice of any action, claim, or lawsuit. CBJ shall notify Consultant in a timely manner of the need for indemnification, but such notice is not a condition precedent to Consultant's obligations and may be waived where the Consultant has actual notice.

23. FORCE MAJEURE. Force Majeure: Whenever performance by Seller of any of its obligations hereunder, is substantially prevented by reason of any act of God, strike, lock out, or other industrial or transportation disturbance, fire, lack of materials, law, regulation or ordinance, war or war conditions, or by reason of any other matter beyond its reasonable control, then such performance shall be excused, and deemed suspended during the continuation of such event and for a reasonable time thereafter, delayed, or adjusted accordingly.

24. CHOICE OF LAW; JURISDICTION. This Contract shall be governed by the laws of the State of Alaska. Jurisdiction shall be in the State of Alaska, First Judicial District.

25. SUCCESSORS. This Contract shall be binding upon the successors and assigns of the parties.

26. PRECEDENCE OF DOCUMENTS. In the event of a conflict between the provisions of this document and its appendices, the order of precedence shall be this document, and Appendices A, B, C, D, E and F.

27. LIMITATION OF LIABILITY.

A. In no event, will Buyer and Seller be liable for, and Buyer and Seller hereby waive against each other, and against the other's affiliates and their respective officers, directors, members, partners, employees, agents, consultants, and subcontractors, any and all claims for or entitlement to incidental, indirect, special, punitive, or consequential damages, including without limitation, loss of profit, remanufacturing costs and rework costs, de-installation or re-installation cost, arising out of, resulting from, or related to the Contract or a party's performance hereunder, whatever the claim (tort, breach of contract or warranty or otherwise) and whatever the forum.

B. IN NO EVENT SHALL SELLER'S AGGREGATE LIABILITY ARISING OUT OF OR RELATED TO THIS CONTRACT, WHETHER ARISING OUT OF OR RELATED TO BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE) OR OTHERWISE, EXCEED THE CONTRACT PRICE.

C. The limitation of liability set forth in B. above shall not apply to (i) liability resulting from Seller's gross negligence or willful misconduct and (ii) death or bodily injury resulting from Seller's acts or omissions.

In Witness Whereof the parties have affixed their signatures the date first above set out:

CITY AND BOROUGH OF JUNEAU

3/9/15
Kimberly A. Kiefer — Date
City and Borough Manager

Pall Corporation

2/22/15
Date

Name

Title D.B. Horton V.P.

Email Dave_Horton@Pall.com

Approved as to content:

3/2/15
Greg Smith — Date
Contract Administrator

CIP Coding: 414900101 750440130 5390

APPENDIX A
SCOPE OF SERVICES

This contract between Pall Corporation (Pall) and City and Borough of Juneau (CBJ) is for the supply and installation assistance of an Aria™ FIT microfiltration water treatment system producing a minimum of 2 Million Gallons Per Day (MGD) of filtered surface water meeting the requirements of the U.S. Environmental Protection Agency's Long Term 2 Enhanced Surface Water Treatment Rule for the removal of cryptosporidium and to provide removal of giardia and sediment causing turbidity. The packaged treatment system is to be installed at the CBJ's Salmon Creek Water Treatment facility, located about 3 miles north of downtown Juneau on Egan Expressway. Subsequent to the award of this contract CBJ intends to bid and award a general construction contract for the Salmon Creek Water Treatment Plant at which time this contract and the agreed upon terms and conditions will be assigned to a general construction contract. The contract between CBJ and Pall will dissolve and the Pall will enter into a contractual relationship with the General Contractor for the project. This arrangement will be similar in all respects to any other equipment supplier relationship established by the General Contractor.

The Aria™ FIT system supplied shall meet the needs of the technical specifications contained in RFP E15-065 Appendix A Scope of Services**,** and as modified and detailed in Attachment 1 to Appendix A Scope of Services - *3.0 Scope of Services* and Attachment 2 to Appendix A Scope of Services - *Membrane Filtration System Specifications.*

Pall shall also supply and deliver manufacturer's recommended spare parts for the microfiltration system as outlined in Attachment 3 to Appendix A Scope of Services - *List of Spare Parts*.

Acceptance Criteria
The system shall be accepted by the end user (CBJ) upon completion of all of the following:

1) Complete system commissioning
2) Completion of operator training
3) Receipt of Final Approval to Operate from Alaska Department of Environmental Conservation

Performance Bond
A 100% Performance Bond will be required prior to award. The bond must be in a form satisfactory to the CBJ. The Performance Bond form is contained in Appendix D.

Warranty
Pall Corporation shall provide a One-Year Warranty for all equipment and hardware furnished for this project including freight and labor, and a ten (10) year Membrane Module warranty, of (3) years absolute and (7) years prorated. Labor for routine replacement such as valves or seals is not included and is the responsibility of CBJ, however, field service labor for critical plant issues or failures is included under the 1 year warranty.

Warranty period starts from the date of startup/beneficial use to operate the facility.

Additional warranty is as outlined in Attachment 4 to Appendix A Scope of Services - *Warranty*

Delivery Schedule

1. The new membrane filtration system must be in Juneau and ready for installation by July 15, 2015.

2. Installation and start-up testing, commissioning and ADEC Approval to Operate shall be obtained by October 1, 2015.

The project schedule in Attachment 5 to Appendix A Scope of Services - *Project Schedule* outlines the tasks and milestone dates needed to achieve the target delivery date of July 15, 2015.

ATTACHMENT 1 to APPENDIX A
SCOPE OF SERVICES

3.0 Scope of Services

3.1 Scope Summary

To meet your needs, Pall is offering our Aria FIT Microfiltration System solution per the technical specifications as detailed in Appendix A – Membrane Filtration System Specifications of the RFP. The below sections 3.1.1 through 3.1.9 are included in order to further clarify our scope, and define items not captured in the RFP (such as scope of field service work, submittal documents, number of microfiltration modules, flux rate, etc.) Additionally, there are several differences between Pall's offering and the RFP requirements, based on design discussions and documents that were developed with Jim Dorn of Carson and Dorn. These changes are summarized in section 3.1.9 and also encompass the basis of Pall's scope proposal.

3.1.1 Scope Summary Table

Item Description	By PALL	By OTHERS
Upstream equipment and unit processes such as Raw Water Pumps, Oxidation System, Coagulation System, Settling Tank, etc.		X
MF Feed Pumps with VFD's		X
MF Feed Strainers	X	
MF Units	X	
Master Control Panel	X	
CIP System	X	
Air Compressors	X	
Air Receiver	X	
Downstream equipment and unit processes such as Filtrate and/or Permeate Pumps, Disinfection System, Ion Exchange System, Finished Water Storage, etc.		X
PALL Control System Programming	X	
Receiving, unloading and safe storage of equipment until ready for installation		X
Installation of all equipment		X
Design of anchorage for Pall equipment		X
Supply, and installation of equipment anchorage		X
Any on-site painting or touch-up painting of equipment supplied		X

Design, supply, and installation of all civil infrastructure inclusive of buildings, fire and safety protection, HVAC, walkways, platforms, etc.	X
Design, supply, and installation of interconnecting pipe, inclusive of pipe supports and flexible connectors	X
Design, supply, and installation of the Motor Control Center (MCC)	X
Design, supply, and installation of electrical wiring, conduit and other appurtenances required to provide power connections as needed from the electrical power source to the PALL control panels, VFDs and other equipment and from the terminal boxes on the skids to the main plant panels	X
Design, supply, and installation of chemical storage	X
Supply of any required chemicals	X
Any permitting requirements	X
Plant Programming and SCADA Development	X

3.1.2 Pall Equipment Description

One (1) Off-Skid Pre-Membrane Strainer

1. One (1) Amiad SAF 6000 10 inch automatic backwashing strainer with 300 micron screen
2. Valves and Instruments

One (1) Pall Aria FIT 6 inch Dual Microfiltration Skid consisting of:

3.1.2.1 One (1) Microfiltration Skid
3.1.2.1.1 One(1) 6 inch Dual Valve Rack with
3.1.2.1.2 Valves and Instrumentation
3.1.2.1.3 Festo Solenoid Manifolds with Festo Remote I/O
3.1.2.1.4 Filtrate Turbidimeters
3.1.2.1.5 Two (2) Filter Racks with 48 module spaces each
3.1.2.1.6 Ninety Six (96) Microfiltration modules

One (1) Clean-in-Place (CIP) System consisting of:

A. One (1) 2,500 gallon HDPE Hot Water/Cleaning Solution Tank
1. Tank Instrumentation
2. 38 kW Immersion Heater

3.1.2.2 One (1) Clean-in-Place (CIP)Transfer Pump Skid
3.1.2.2.1 One (1) Clean-in-Place (CIP)Transfer Pump
3.1.2.2.2 Valves, Instruments and Controls
3.1.2.3 One (1) Chemical Transfer System

3.1.2.3.1 Four (4) Duty Air Operated Double Diaphragm Transfer Pumps (1 per chemical)

3.1.2.3.2 Valves and Controls

Master Control Panel consisting of:

1. NEMA 4 Painted Carbon Steel Enclosure
2. ControlLogix PLC with Ethernet Port
3. Inductive Automation Ignition software
4. Industrial PC
5. I/O for off-skid Instrumentation
6. Ethernet Communication between Pall PLC and Remote I/O

Off-Skid Instruments consisting of:

1. Common Feed Turbidimeter - Hach 1720E with SC200 Controller
2. Common Filtrate Turbidimeter - Hach 1720E with SC200 Controller
3. Common Feed Temperature Transmitter – Rosemount 148HNN with Thermowell

Compressed Air Equipment consisting of:

1. Air Compressors (1+1)
2. Valves, Instruments and Controls

Desktop PC with Monitor and Operating Software (Microsoft Office, PC Anywhere, Inductive Automation Ignition)

3.1.3 Submittals including:

- P&ID
- General Arrangement Drawings for Pall-Supplied Equipment
- Electrical Interconnect Drawing (Power One-Line, I/O Interconnection and Network Layout
- Electrical Drawings for Pall-Supplied Panels
- Mechanical Replacement Parts List
- Electrical Replacement Parts List
- Compressed Air System Information
- AP Skid Installation Manual
- Cutsheets for Pall-Supplied Off-Skid Components
- Installation & Startup Checklist
- Operation & Maintenance Manual (Delivered at Time of Equipment Shipment)
- Software License Transfer Documentation (Delivered at Time of Equipment Shipment)

3.1.4 Services and Labor-Site Field Service

On-Site Field Service

A. Fourteen (14) 10-hour days are included in Pall Scope of Supply for commissioning of the MF System.

B. Two (2) 8-hour days are included in Pall Scope of Supply for training the Owner's operators.

C. Additional services may be may be added if needed at Pall's standard rate of $165/hr (USD), plus travel and expenses.

3.1.5 Supply by Others

A. Pressurized Raw Water Supply (1810 gpm maximum instantaneous flow at 50 psig)

B. Pressurized (384 gpm at 30 psig) Potable Water supply for MF System Backwashing

C. All necessary infrastructure

D. All installation

E. All necessary permits

F. All interconnecting piping between skids

G. All chemicals and chemical storage

H. Anchor Bolts

3.1.6 Feed Fluid Characteristics

The MF units will be supplied with raw water from Salmon Creek. The anticipated MF Feed water quality is shown in the following table.

Parameter	Inst. Min	Daily Avg	Inst. Max	Unit	Stated or Assumed?	Notes
Algae			0	Algae/50mL		
Alkalinity				ppm as $CaCO_3$		
Aluminum, Total (Al^{+3})				ppm		
Barium (Ba^{+2})				ppm		
Calcium, Total (Ca^{+2})		25		ppm as $CaCO_3$	Stated	
Chloride (Cl^{-1})				ppm		
Copper, Total (Cu^{+2})				ppm		
Dissolved Organic Carbon (DOC)				ppm		
Fats, Oils, Grease (FOG)			0	ppm	Assumed	
Hardness, Total				ppm as $CaCO_3$		

Hydrocarbons			0	ppm	Assumed	
Iron, Total (Fe)		0.04		ppm	Stated	
Magnesium, Total (Mg)				ppm as $CaCO_3$		
Manganese (Mn^{+2})	N/D	N/D	N/D	ppm	Stated	
Organic Carbon, Total (TOC)	0.5	0.6	0.65	ppm	Stated	Average is Assumed
Ortho Phosphate (PO_4^{-3})				ppm PO_4		
pH		7			Stated	
Phosphorous, Total (P)				ppm PO_4		
Potassium (K)				ppm		
Reactive Silica ($SiO_{2)}$				ppm		
Silica, Total (SiO_2)				ppm		
Sodium (Na^{+1})				ppm		
Specific Conductance				µMHO/cm		
Strontium (Sr^{+2})				ppm		
Sulfate (SO_4^{-2})				ppm as SO_4		
Temperature	0.5		10	˚C	Stated	
Total Suspended Solids (TSS)	0.4	8	30	ppm	Assumed	Average is Assumed
True Color				ppm		
Turbidity	0.2	4	15	NTU	Stated	Average is Assumed

In the event that the feed fluid is outside these parameters the system performance, cleaning protocol, operating parameters, and/or warranties may be affected.

3.1.7 Filtrate requirements

Average Daily Net Filtrate Flow	2.0 MGD
Filtrate Turbidity	<0.1 NTU 95% of the time, < 0.3 NTU 100% of the time

3.1.8 Design Conditions

Flux	47 GFD
Flux Maintenance (FM) Frequency	28.5 Minutes
Enhanced Flux Maintenance (EFM) Frequency	1 Day
Clean In Place (CIP) Frequency	30 Days
Minimum Recovery	96%

3.1.9 Microfiltration System Design Basis

The Microfiltration System offered in this Proposal is based on design discussions and documents that were developed with Jim Dorn of Carson and Dorn.

- Raw Water/Feed Pumps – The Owner will supply the required feed water flow and pressure to the Microfiltration Skids. This may require new raw water/feed pumps and VFD's. Pall will control the operation of the raw water/feed pumps to meet the Microfiltration System requirements.
- Microfiltration System Feed Tanks – By supplying a direct, pressurized feed to the Microfiltration Skids, the need for feed tanks is eliminated, resulting in reduced equipment footprint.
- Microfiltration Skid Feed/Recirculation Pumps – By supplying a direct, pressurized feed to the Microfiltration Skids, the need for on skid feed pumps is eliminated.
- Reverse Filtration (Backwash) Pressurized Water Supply – The Owner will provide a supply of pressurized potable water from the Distribution system for backwashing the microfiltration membranes and to provide potable water for the EFM/CIP Cleaning System.
- Reverse Filtration (Backwash) Tanks – By providing a supply of pressurized potable water from the Distribution system for backwashing the need for reverse filtration (backwash) tanks is eliminated, resulting in reduced equipment footprint.
- Microfiltration Skid Reverse Filtration (Backwash) Pumps – By providing a supply of pressurized potable water from the Distribution system for backwashing the need for reverse filtration (backwash) pumps is eliminated.
- Expansion Capability – By removing the feed and reverse filtration (backwash) tanks sufficient space is available to add two additional microfiltration skids in the existing building.

Aria FIT Global Component Selections

Manufacturer	Manufacturer's Part Number	Size	Tag # (s)
Flow Instruments			
	Functional Areas - VALVE RACK & RF		
Rosemount	Sensor: 8711SSE060U1N0D1DW Transmitter: 8732EST2A1N0DA1M4D1	DN150 (6")	FIT- 1X01, FIT-9X01
	Functional Area - COMPRESSED AIR		
ifm Efector	SD8001 w/ EVC002 Cable (2m)	0.0 - 158.9 scfm	FIT-6101A/B
	Flow Indicators		
Dwyer	"Rate-Master" RMB-82-SSV-BPF		AIT-8X01, AIT-8X09
	Flow Switches		
ifm Efector	SR5900, SF6201 & E40174		FS-5101
Analytical Instruments			
	Functional Area - VALVE RACK		
Hach	Sensor: 1720E + Controller: SC200, 29768-00	Turbidimeter	AIT-8X01, AIT-8X09
Hach	Sensor: 660SC + Controller:SC200, 29770-00	Laser Turbidimeter	AIT-1X01
	Functional Area - CIP		
Rosemount	Analyzer: 1056-01-22-32-AN with Cable Gland: 23554-00 pH Sensor: 3900VP-02-10 ORP Sensor: 3900VP-02-12 15-ft Cable (qty=2): 23645-07 4.01 pH Buffer Sol'n: 9210012 9.18 pH Buffer Sol'n: 9210014 ORP Std Sol'n: R508-8OZ	pH / ORP	AIT-5101/5102, AE-5101, AE-5102
Pressure Instruments			
	Functional Area - VALVE RACK		
Rosemount	2088G2S22A1M5DWKBQ4		PIT/PT-1X01, PIT/PT-1X02
	Functional Area - FEED		
Rosemount	2088G2S22A1M5DWQ4		PIT/PT-3X01, PIT/PT-3X02
	Functional Area - COMPRESSED AIR		
Rosemount	2088G3S22A1M5DWKBQ4	-14.7 - 800 psi	PT-6101
Rosemount	2088G2S22A1M5DWKBQ4	-14.7 - 150 psi	PT-6102
Noshok	40.500-60PSI / kPa Dual Scale		PI-6101A/B, PI-6105A/B
Noshok	40.500-160PSI / 11 BAR Dual Scale		PI-6103A/B
Noshok	40.500-300PSI / 20.5BAR Dual Scale		PI-6102, PI-6104
ifm Efector	PK6224 +Cable: EVC001, 2, or 3		PS-6101
Level Instruments (Pressure Based)			
	Functional Area - CIP		
Rosemount	2088G1S33A1M5Q4		LT-5101
Temperature Instruments			
	Functional Area - FEED		
Rosemount	Transmitter: 148HNNAU2XAQ4 Probe & Thermowell: 0068N21N00A040T44XA (Q4 = Optional 3-pt calib, T20=Tapered thermowell)	316SST 4" Immersion	TT-3X01
	Functional Area - CIP		
Rosemount	Transmitter: 148HNNAU2XA Probe & Thermowell: 0068N21N00F120T44XA	Alloy 20 12" Immersion	TT-5101
Rosemount	Transmitter: 148HNNAU2XA Probe & Thermowell: 0068N21N00F040T44XA	Alloy 20 4" Immersion	TT-5102

Manufacturer	Size	Manufacturer's Part Number	Tag #s
Butterfly Valves, Limit Switches, Pneumatic Positioners, External Travel Stops			
Bray	DN50 (2")	VALVE - 31-0200-11010-169 LEVER HANDLE - 01-0200-21100-007	HV6103A/B
Bray		VALVE - 31-0200-11010-169 ACTUATOR - 92-0630-11305-532	V8X01, V3X3Y, V1X3Y, V1X7Y, V1X9Y, V1X11Y
Bray		VALVE - 31-0200-11010-169 ACTUATOR - 92-0630-11305-532 POSITIONER - 6A6DR5-0100NN-105KA3	FCV6101A/B
Bray	DN80 (3")	VALVE - 31-0300-11010-169 ACTUATOR - 92-0830-11305-532	V1X04, V1X15, V1X10Y V1X4Y, V5101, V5102, V5103, V5104, V5105, V5106, V5108, V5109
Bray	DN100 (4")	VALVE - 31-0400-11011-169 ACTUATOR - 92-0830-11305-532	V1X02, V1X05, V1X6Y, V1X8Y
Bray		VALVE - 31-0400-11011-169 ACTUATOR - 92-0830-11315-532	V1X09
Bray	DN150 (6")	VALVE - 31-0600-11011-169 ACTUATOR - 92-0830-11305-532	V1X03, V1X06, V1X07, V3X2Y, V1X2Y
Bray		VALVE - BRAY 31-0600-11011-169 ACTUATOR - 92-0830-11305-532 POSITIONER - 6A6DR5-0200NN-105KA4	FCV1X01
Bray	DN250(10")	VALVE - 31-1000-11011-169 GEAR OPERATOR - 04-0300-21207-002	HV8X01, HV8X02
Bray	for all sizes	LIMIT SWITCH - 52-1001-12614-536	
Diaphragm Valves			
Plast-O-Matic	DN6 (1/4")	BSDA025T-NC-PV	V1X23
ASAHI	DN20 (3/4")	1589007	V1X19, V1X22
ASAHI	DN25 (1")	1589010	V1X20
ASAHI	DN15 (1/2")	1589005	V5107
Check Valves			
Jaco	DN15 (1/2")	CV-8 K (Kynar for chem injection)	CV5101
Apollo	DN25 (1")	62-505-01	HV1X03
RITEPRO (BRAY)	DN40 (1.5")	Bray (Ritepro) V1515XEZNSF.8	CV6103
RITEPRO (BRAY)	DN50 (2")	V0215XEZNSF.8	CV6102 , CV6103
RITEPRO (BRAY)	DN80 (3")	V0315XEZNSF.8	CV1X01
Ball / Sample Valves			
John Guest	DN6 (1/4")	PPSV040808W	HV1X01, HV1X02
FlowTek (Bray)	DN15 (1/2")	S70-03-3-R-R-L (SST valve for compressed air)	HV6102, HV6103A/B, HV6101A/B, HV6105A/B, HV6114
FlowTek (Bray)	DN25 (1")	S70-05-3-R-R-L (SST valve for compressed air)	HV10X3, HV6106A/B, HV6107A/B, HV6115
FlowTek (Bray)	DN40 (1.5")	S70-07-3-R-R-L (SST valve for compressed air)	HV6120A/B, HV6127A/B
FlowTek (Bray)	DN50 (2")	S70-08-3-R-R-L (SST valve for compressed air)	HV6117, HV6120A/B, HV6121A/B, HV6122A/B,

Aria FIT Global Component Selections

Manufacturer	Manufacturer's Part Number	Size		Tag # (s)
Automatic Backwashing Strainers				
Amiad	SAF-6000 10 inch, 300 micron	10"	w/out controls	S-3x01
Immersion Heaters				
Watlow	MCP86T375-02	38 kW	23 W/in2	H-5101
Tanks				
Snyder	5090000N	2500 gal (10m^3)		T-5101

Manufacturer	Manufacturer's Part Number	Discharge x Suction Size Inch (mm)	HP (Kw)	Tag #'s
Centrifugal Pumps				
Xylem / Goulds	5SH2L52D0	2 x 2-1/2 (50 x 65)	10 (7.5)	P5101A
Air Driven Dual Diaphragm Pumps				
Wilden	P0.025/PPPPP/WFS/TF/PWF	0-5 GPM (0-1135 l/h)	NA	P90,P91, P92, P93

Manufacturer	Manufacturer's Part Number	Skid
Solenoid Manifolds		
Festo	CPX	Valve Rack
Festo	CPX	CIP Skid W/Xfer Pump
HMI and PLC		
Allen Bradley	CompactLogix	Master Control Panel
TBD	15 inch Industrial PC	Master Control Panel
Inductive Automation	Ignition Software	Master Control Panel
Dell	Desktop PC and Monitor	
Microsoft	Desktop PC Office Software	

ATTACHMENT 2 to APPENDIX A
SCOPE OF SERVICES

MEMBRANE FILTRATION SYSTEM SPECIFICATIONS

PART 1 GENERAL

1.1 SUMMARY

A. This specification defines requirements for a membrane filtration system intended to remove particulate matter, Giardia and Cryptosporidium cysts and oocysts for compliance with the US Environmental Protection Agency's Long Term 2 Enhanced Surface Water Treatment Rule and in accordance with the US Environmental Protection Agency's Membrane Filtration Guidance Manual.

B. This specification is intended to define requirements for an automated, stand-alone system. Included with the system package provided by the Membrane System Supplier (MSS) will be all hardware, controls, instrumentation, software, programing, pumps, valves, tanks and piping to allow for trouble-free operation of the entire MF system, with only occasional operator intervention. The MSS is to provide complete systems for the following: Filter Modules and Filter Racks; Valve Racks; Direct Integrity Test System; Reverse Flush System; Clean-In-Place System; Chemical Neutralization System; Air Compressor System; and Master Control Hardware, Software and Programming.

C. The MSS shall provide all information about the membrane filtration system necessary for the Alaska Department of Environmental Conservation to approve the system for use in complying with the requirements of the US Environmental Protection Agency's Long Term 2 Enhanced Surface Water Treatment Rule.

D. All wetted components shall be NSF 61 listed and shall comply with the requirements of the federal Reduction in Lead in Drinking Water Act.

E. Items not covered by this specification include:

1. Raw water feed pumps, their VFDs and raw water feed piping to the Valve Rack and Filter Rack (control of the feed pump will be by the MSS).
2. Permeate piping to the Salmon Creek Pump Station clear well.
3. Foundations and anchors for securing the equipment at the site.
4. A building to house the system (dry environment between 35°F and 98°F).
5. Installation of the skid mounted and loose components of the system in the desired location.
6. Assembly and installation of piping to deliver/discharge water and wastes to/from the system.

7. Wiring for power, off-skid instrumentation, or communication between off-skid control panels or SCADA systems.
8. Back-up power or UPS for computers, PLCs, and other critical devices.
9. Operation and maintenance of system.
10. Interconnecting piping between the membrane system skid and the module rack or between complementary equipment that may be purchased from or provided by others.
11. Supply of chemicals required for Clean-in-Place (CIP), Enhanced Flux Maintenance (EFM), instruments or other purposes.

F. WARRANTY: The MSS shall provide a One-Year Warranty for all equipment and hardware furnished for this project including freight and labor.

1.2 MEMBRANE FILTRATION SYSTEM GENERAL REQUIREMENTS

A. This specification defines requirements for a membrane filtration system intended to remove particulate matter, Giardia and Cryptosporidium cysts and oocysts for compliance with the US Environmental Protection Agency's Long Term 2 Enhanced Surface Water Treatment Rule.

B. At a minimum the proposed system shall be listed on the California Department of Public Health Alternative Filtration Technology Summary.

C. The membrane filtration system shall have had its cryptosporidium log removal value established under the requirements of the US Environmental Protection Agency's "challenge testing" requirements in 40 CFR 141.719 and the US Environmental Protection Agency's Membrane Filtration Guidance Manual.

D. The membrane filtration system shall consist of a least two units and be capable of treating a nominal capacity of 1,600 gpm and produce a minimum of 2.0 MGD of treated water.

E. The equipment provided shall be certified to provide at least 5.5 log reduction of cryptosporidium and giardia cysts and oocysts as defined in Paragraph C above.

F. The equipment shall achieve filtrate turbidity values of 0.1 nephelometric turbidity units (NTU) or less greater than 95% of the time and 0.3 NTU or less 100% of the time.

G. Raw water quality:

1. Turbidity (0.2 NTU – 15 NTU)
2. Temperature (0.5°C - 10°C)
3. Iron (0.04 mg/l)
4. Manganese (non-detect)

5. pH (7.0 pH)
6. TOC (0.5 mg/l to 0.65 mg/l)
7. Calcium Hardness as $CaCO_3$ 25 mg/l

H. Pump motors shall be 480 v, 3 phase 60 hz motors.

1.3 ACCEPTABLE MANUFACTURERS

A. The manufacturer of the microfiltration (MF) system shall have at least 10 years experience supplying hollow fiber filtration systems and demonstrate that employees have the knowledge to provide the infrastructure to fully support the system after installation of the equipment. This includes the ability to offer the following services.

1. Telephone support during normal business hours in the time zone where the support services are located.
2. Start-up/commissioning assistance
    a. Installation oversight/check-out
    b. Commissioning the system
    c. Operator Training
3. On-demand services
    a. Process/equipment troubleshooting and repair
4. Service Contracts
    a. 24-hour each day telephone support
    b. Maintenance Contracts (Equipment and Clean-In-Place procedures)
    c. Remote or on-site occasional system status monitoring
    d. Operations contracts
    e. On-site service for equipment/process troubleshooting and repair
5. Extended warranty coverage

B. The acceptable manufacturer shall be currently certified as a supplier to meet quality standards as defined by International Standards Organization (ISO) standard 9001.

1.4 SUBMITTALS

A. Submit within forty five (45) days of receipt of notice to proceed, complete drawings showing the overall dimensions and elevations including anchoring baseplate dimensions, equipment pad sizes and center lines, piping and wiring interface points, and the location of equipment required to be accessed during normal operation of the system. Unless otherwise specified, these drawings are to be provided for information. Coordinate equipment layout with Owner.

B. Provide submittals on all equipment items, piping, valves, fittings, pumps, tanks, sensors, and other such items necessary for receiving plan approval from the Owner and from the Alaska Department of Environmental Conservation.

C. Submit an Installation, Operation, and Maintenance (IOM) manual with the equipment. The IOM shall be printed in black and white onto 20 lb copy paper and placed in a sturdy 3 ring binder with tabulated index, and clear plastic pockets for drawings. Format for supply is three hard copy and six (6) electronic copies on separate, labeled, CD's. These shall include a system functional description, detailed component information (provided electronically on a submittal CD), and a recommended replacement parts list.

1.5 COMPLETION TIME

A. Submittals as detailed above – 45 days from notice to proceed.

B. New Membrane Filtration System must be in Juneau, Alaska ready for installation no later than July 15, 2015.

C. Installation, start-up testing, commissioning and Alaska DEC Final Approval to Operate of the new membrane filtration system must be complete by October 1, 2015.

PART 2 MICROFILTRATION SYSTEM GENERAL REQUIREMENTS

2.1 PERFORMANCE

A. The equipment provided shall be certified to achieve at least 5.5-log reduction of Giardia and Cryptosporidium cysts and oocysts at the specified maximum filtrate flow rate.

B. The equipment provided shall achieve filtrate turbidity values of 0.1 Nephelometric Turbidity Units (NTU) or less at least 95% of the time and less than 0.3 NTU 100% of the time at the specified maximum flow rate under normal circumstances.

C. Recovery: The systems must operate with a recovery (ratio of filtrate produced/raw water used) in excess of 95% for drinking water.

2.2 EXPERIENCE

A. The MSS shall provide experienced and qualified personnel for all operator training. Provide previous training history of personnel that will train CBJ operators. Trainer shall have provided training for at least 5 other installations.

2.3 FACTORY ACCEPTANCE TESTING (FAT)

A. MF system shall be fully tested prior to shipment. The purpose of the testing is to assure that the system components will be fully functional when properly installed at the site. The testing shall include:

1. Instrument operation and calibration verification of on-skid equipment.
2. Check operation of all on-skid pumps, valves, strainer, etc.
3. Process testing, including running water through the system to verify the various operations and check for leaks.
4. Verify that equipment supplied matches approved Process and Instrumentation Diagrams (P&ID) and electrical drawing.
5. Verify alarms and alarm display.
6. Verify that the system programming follows the System Functional Description.

PART 3 OPERATIONS

3.1 FULLY AUTOMATED PROCESSES

A. The MF system shall include all equipment and controls for automated operation of the system in the following modes.

1. Filtration
2. Regeneration/Flux Maintenance
3. Integrity Test

3.1.1 FILTRATION

A. The filtration mode is the normal mode of operation. The filtration mode shall allow the operator to preset the desired flow rate for clean water production. The system will automatically adjust the pump speed of the Owner furnished pumps to deliver this rate of water from the system. The system control shall also be configured to vary production rate based on the availability of raw water upstream of the system, or run to maintain a level in the Salmon Creek Water Storage Reservoir. Owner will provide a 4 – 20 mA signal of the reservoir level for control purposes. If the system is empty, the system will perform an

automated fill/vent procedure. The system will display alarm conditions on the Human Machine Interface (HMI), notifying the operator of any abnormal conditions.

3.1.2 REGENERATION/FLUX MAINTENANCE

A. Regeneration or flux maintenance shall automatically occur at an adjustable preset time or volume of water processed interval. The process shall be fully automated and require no intervention by an operator. The flux maintenance must include the injection of air to assist in removal of solids from the membrane fibers and continuous backflow of permeate water through the membranes to eliminate the solids from the system. The modules shall then be flushed to remove any remaining solids and air bubbles through a selectable option of a feed side rinse using raw water or a backwash with filtrate. The system shall alarm the operator of abnormal conditions that would prevent the system from entering the regeneration cycle. The entire flux maintenance procedure should require no more than two minutes.

3.1.3 INTEGRITY TEST

A. The MF system must be capable of direct integrity testing (DIT) meeting the requirements of the US Environmental Protection Agency's Long Term 2 Enhanced Surface Water Treatment Rule. The testing must be fully automated and should not require operator intervention unless a failure is detected. The system must automatically alarm if the DIT fails and be capable of shutting the system down on failure. If a failure occurs, the operator shall be able to easily and quickly identify the defective module without special equipment that requires every module to be individually tested (such as sonic testing) or requiring the module to be removed from the system. Typical repair of a defective module shall not require full removal of the module from the system, and the defective module shall be capable of being repaired and returned to service in 30 minutes or less. If removal of a module is required, the module space shall be capable of being easily blanked off and allow the system to be returned to service using the remainder of the modules.

3.1.4 SEMI-AUTOMATED PROCEDURES

A. CHEMICAL CLEAN-IN-PLACE (CIP) – SYSTEM

1. The system shall automatically notify the operator for the need to chemically clean the membranes based on an increase in trans-membrane pressure, or at a preset duration since the last CIP was performed, whichever occurs first. The CIP process will be a semi-automated process requiring the operator to perform certain operations, but the process will be primarily automated. The MF system controller shall guide the operator through a detailed sequence of steps to assure that the CIP is properly performed. The actions that an operator is expected to take during this procedure are as follows:

a. Perform the CIP process by following the sequenced procedure as defined by the system controller.

b. Assuring that there is adequate warm water available to perform an effective CIP.

c. Initiating the automated CIP recirculation cycle/rinse at the system's control panel.

d. Repeating the above steps for the second cleaning cycle.

e. Performing the final rinse routine and return the system to service.

PART 4 EQUIPMENT TO BE PROVIDED

A. The MF system shall be a complete package that is primarily skid mounted and contains all pumps, manual & automated valves, tanks, instruments, membranes, control system, on-skid piping, wiring, conduit, and tubing to make up a fully operational system. To accommodate shipping, unloading, and layout flexibility, the system shall be provided in one or more pieces to be mounted at the site for installation. If it is necessary to separate the system into two or more assemblies, such as when an off-skid module rack is provided, all the necessary interconnecting piping, tubing, wiring, etc. shall provide for the system to operate as a unit. It is the responsibility of the installation contractor to install the interconnect piping, wiring, tubing, etc.

MF system shall include the following features as a minimum:

- Feed and RF (Reverse Flush) tanks with associated level instrumentation
- Feed/recirculation pump
- Reverse Flush (RF)
- On-skid control of VFD Feed and RF pumps.
- On skid automatic backwashing pre-filter
- Pressure transmitters for pre-filter and membrane pressure differential measurement
- Temperature transmitter
- Filtrate/backwash flow transmitter
- Modulating raw water level control valve on inlet to feed tank
- Module rack and associated piping
- Fully wired control panel with HMI and PLC to provide automation
- Fully automated Integrity Test
- Fully automated air scrub/backwash system
- Semi-automatic CIP (Clean In Place) system
- All piping, valves, wiring, supports, and associated equipment to provide a fully functional system.
- Air compressor system
- Turbidimeters (on-skid)
- EFM (Enhanced Flux Maintenance)
- Automated CIP Chemical Transfer
- CIP Neutralization System
- Uninterruptible Power Supply (UPS)

- Alarm Dialer
- Modem/PC for remote access and data trending

4.1 MEMBRANES

A. Microfiltration modules shall be of hollow fiber construction and configured for a normal filtration flow direction from outside the fiber through to the inside (lumen) of the fiber. They shall be 0.1 micron rated, high-crystalline PVDF (Polyvinylidenefluoride).

B. Membranes and module shall be compatible with the following cleaning and treatment chemicals at the levels indicated.

Chemical	**Maximum Concentration**
NaOCl	< 5000 ppm
NaOH	< 4%
HNO_3, HCl, H_2SO_4	< 10%
Citric Acid	< 20%
Oxalic Acid	< 2%
EDTA	< 0.4%
Hydrogen Peroxide	< 2%
$Na/KMnO_4$	< 5000ppm
Chlorine dioxide, ClO_2	< 0.2 ppm

C. Membrane and module shall be compatible with the following coagulants:
- Alum (Aluminum Sulfate)
- PACl (Polyaluminum Chloride)
- ACH (Aluminum Chlorohydrate)
- $FeCl_3$ (Ferric Chloride)
- $Fe_2(SO_4)_3$ (Ferric Sulfate)

4.1.1 MEMBRANE MODULES

A. The membrane fibers shall be encased in an ABS (Acrylonitrile-Butadiene-Styrene copolymer) housing that is suitable for operating pressures up to 58 psig and up to 104F. The membrane fibers together with the housing shall be referred to as a membrane module.

B. The modules shall be constructed as an integral unit, without mechanical seals such as o-rings and gaskets, to eliminate the risk of raw water bypass to the filtrate side of the membrane.

C. The modules shall not require special lifting mechanisms for handling and must be able to be individually removed from the membrane rack.

4.2 PUMP ASSEMBLIES

4.2.1 FEED PUMPS

A. MF system shall be provided with a control system to control flow rate from VFD controlled feed pumps furnished and installed by the Owner. The feed pumps are driven by variable frequency drives (VFD) so that the filtrate flow rate is maintained over varying levels of flow resistance due to loading of the membranes. The MSS shall furnish a signal to the VFDs to control pump speed and flow rate.

4.2.2 CLEAN IN PLACE (CIP) FEED PUMP ASSEMBLY

A. MF system shall be supplied with an on-board centrifugal pump assembly to feed the CIP solution to the membrane modules. The pump shall provide the specified rate of flow at the required pressure. Pumps shall have 480 v, 3 phase, 60 hz motors.

4.2.3 REVERSE FILTRATION (RF) PUMP ASSEMBLY

A. For backwash of the membranes, the system shall include an on-skid centrifugal pump assembly to deliver filtrate from the RF tank in the reverse direction to the membrane modules. The pump shall provide the specified rate of flow at the required pressure. Pumps shall have 480 v, 3 phase, 60 hz motors.

B. The RF pump assembly shall be driven by the variable frequency drive (VFD) so that the proper flow to backwash the membranes can be maintained, even if the number of modules changes. The VFD shall be mounted on the MF skid in a NEMA 4X enclosure.

4.3 TANKS

4.3.1 CIP TANK

A. The MF system shall include a CIP tank.

B. The CIP tank shall serve the purpose of a recycle tank for chemical clean in place (CIP) solutions. The tank shall be equipped with a manway located on the top of the tank.

C. The CIP tank shall be equipped with level instrumentation and a modulating control valve sized to control tank level.

D. The CIP tank shall be constructed of HDPE and be compatible with CIP/water treatment chemicals such as sodium hypochlorite, organic acids, potassium

permanganate, chlorine dioxide, and sodium hydroxide. Tank capacity shall be located off-skid with interconnecting piping provided by supplier but installed by others.

4.3.2 REVERSE FILTRATION (RF) TANK

A. A closed tank shall be included to collect clean filtered water to be used for backwash of the membranes.

B. The RF tank shall be equipped with level instrumentation and an on-off valve to prevent overflow in normal operation.

C. The RF Tank shall be fully enclosed to prevent contamination. It shall be vented through a filter assembly with removable cartridges rated at 10 microns absolute.

D. The RF tank shall be constructed of HDPE and be compatible with CIP/water treatment chemicals such as sodium hypochlorite, organic acids, potassium permanganate, chlorine dioxide, and sodium hydroxide. Tank capacity shall be located off-skid with interconnecting piping provided by supplier but installed by others.

4.4 INSTRUMENTATION

A. The MF unit shall include at a minimum the following instruments to monitor and report to the control system:

- Feed tank level
- Reverse filtration tank level
- Pre-filter inlet pressure
- Pre-filter outlet/module feed pressure
- Filtrate outlet pressure
- Water temperature near the module
- Filtrate flow rate exiting the membrane modules
- Throttling valve position
- Pressure switch for low-air pressure
- Module regeneration air flow rate

B. All analog instrumentation shall use 24VDC, 4-20 mA output. An alarm will sound if the system detects a transmitter failure.

C. Local display of the following shall be included, either as integrated into the transmitter, or as individual indicators for the following:

- Feed tank level
- Reverse filtration tank level
- Pre-filter inlet pressure
- Pre-filter outlet/module feed pressure
- Filtrate outlet pressure
- Filtrate flow rate
- Instrument air pressure for valve actuation

- Instrument air pressure for module regeneration
- Module regeneration air flow rate

D. On-skid instrumentation:
- Hach 660 Laser Nephelometers or equal

4.4.1 LEVEL TRANSMITTERS

A. Tank level transmitters provide accurate indication of tank level using a pressure measurement of the head in the tank. Wetted components shall be 316L stainless steel. Electronics shall be Factory Mutual (FM) approved and Local LCD display provided.

B. Calibration shall be performed with the use of a Hart Communicator.

C. Level transmitter shall be Rosemount Pressure Indicating Transmitter – 0-30 PSI. Model 2088G1S22A1M5 or equal.

4.4.2 PRESSURE TRANSMITTERS

A. Pressure transmitters shall be FM approved, with 316L stainless steel wetted components.

B. Calibration shall be performed with the use of a Hart Communicator.

C. Pressure transmitter shall be Rosemount Pressure Indicating Transmitter – 0-150 PSI. Model 2088G2S22A1M3 or equal.

4.4.3 FLOW TRANSMITTERS

A. Flow transmitters shall be magnetic type, with PTFE lined wetted components and 316L SST electrodes. Electronics shall be FM approved.

Transmitter Specifications:

Manufacturer:	Rosemount or equal
Model:	8711TSE060U1N0DW Flow Tube w/ 8732CT03N0M4 Transmitter
Flow Tube Specs:	6” Wafer Type
Liner:	Teflon
	Integral mount to 8732C Transmitter
Electrodes:	Two 316LSST, one ground
Transmitter:	5-30V DC Power
Enclosure:	NEMA 4X CSA Type 4X, Integral Mount

4.4.4 TEMPERATURE TRANSMITTERS

A. The temperature transmitter is used to protect the membranes from high temperature (maximum temperature entering membrane =104 deg F), and to monitor CIP/EFM temperature to assure proper cleaning.

B. Temperature transmitter shall be RTD type with thermowell constructed of 316 SS.

C. Approved supplier shall be Rosemount (Model 0068w/ 144 Transmitter) or equal.

4.4.5 PRESSURE GUAGES

A. Pressure Gauges shall be bourdon tube type with a liquid filled 2 ½" diameter dial display. Tube, socket, and case materials shall be 316 SST. Readout in both PSI and kPa.

B. Approved supplier shall be Ashcroft or equal.

4.4.6 PRESSURE SWITCHES

A. The pressure switch is used to verify that the air pressure is adequate to actuate the control valves and provide adequate air for the air scrub.

B. The pressure switch shall be a diaphragm type with dual action control in a NEMA 4 housing. Stainless steel shall be used for contact with the process air.

C. Approved supplier shall be Barksdale or equal.

4.5 VALVES

A. Valves in contact with raw water or filtrate water shall contain wetted components of stainless steel, PVC, or food grade elastomers that are NSF 61 listed.

4.5.1 AUTOMATED VALVES

A. Automated valves used for throttling flow control, or on/off valves that cycle regularly shall be butterfly type and incorporate a pneumatic actuator controlled by a 5/2-way solenoid valve. Butterfly valves shall be lug-style for capture between ANSI B16.5 style flanges. Automated valves and their actuator/positioner shall be certified by the manufacturer to be acceptable for use up to 1,000,000 cycles in water service, using clean, dry, instrument air as the driving force.

B. Pneumatic actuators shall be double rack and pinion type. Actuators shall operate at a drive air pressure of 90 PSIG or greater.

C. Air to valve actuators must be controlled by 5/2-way electrical solenoid valves that receive electrical signals from the control system. Solenoid valves shall be block mounted. Manual actuation capability is available so that the system's normally automated valves can be controlled in the event that the main system controller fails. Each automated valve without a spring return actuator shall include two (2) variable port valves that can be set to choke airflow to the actuators, allowing adjustment of opening and closing valve speed.

D. Tubing to deliver air to actuators shall be ¼" polyurethane.

E. Level Control valve shall be 6" Tyco/Keystone 222LT Lug-Style Butterfly or equal. Actuator shall be Keystone/Morin 79U Spring Return Pneumatic – Rack and Pinion or equal. Positioner shall be manufactured by SMC or equal.

F. Actuated valves shall be Tyco/Keystone 222LT Lug-Style Butterfly or equal. Spring return actuator shall be Keystone/Morin 79U Spring Return Pneumatic – Rack and Pinion or equal. Dual Acting actuator shall be Keystone/Morin 79U Dual Acting Pneumatic – Rack and Pinion or equal.

G. Solenoid valves shall be manufactured by Festo or equal.

4.5.2 MANUAL VALVES

A. Manual valves for on/off service shall be ball or butterfly type. For throttling service, manual valves shall lock in place to prevent position changes without manual intervention.

B. Water and Low Pressure Air (<50psi)

1. Butterfly valves shall be Tyco/Keystone 222LT Lug-Style Butterfly or equal. Body shall be cast iron. Disc and stem shall be 316 SS. Seat shall be EPDM Food Grade.
2. Ball valves greater than or equal to 1 inch shall be Spears 3629 Socket Weld or equal.
3. Ball valves less than 1 inch shall be Spears 1529 or equal Threaded.
4. Globe valves shall be Trueline N-651 200 PSI Stainless Threaded (316 SS) or equal
5. Water check valves shall be Spears Butterfly Check 542G-060, PVC Body or equal.
6. Air check valves shall be Conbroco SST Ball Check - APOLLO #62-107-01 or equal.

C. High Pressure Air valves shall be Numatics VL40N12YA w/ Muffler, Lockout Capable or equal.

D. Control Air pressure regulators shall be Monnier Model FR22 Coalescing Filter/Regulator w/gauge or equal.

E. Process regulator shall be Cashco DL Series or equal.

4.6 CONTROL SYSTEM

A. The control system shall be capable of operating the system automatically with a minimum of operator intervention. In automatic mode, the system shall monitor the instrument readings and adjust the system's operation based on those readings in accordance with the preprogrammed logic. The control system shall alarm operators of abnormal conditions, and provide an interface so that an operator can manually operate the system.

Programmable Logic Controllers – The MSS shall provide a control system capable of multiple skid control (initially 2 skids with future expansion up to 4 skids), the ControlLogix™ PLC processor or equal will be used in the master control panel with a Festo CPX I/O manifold or equal on each skid.

4.6.1 CONTROL ENCLOSURE

A. The MF system shall have a main control panel. The control panel shall be NEMA 4 rating and be designed and constructed per the National Electrical Code (NFPA 70) and NFPA 79. The main control enclosure shall be constructed of carbon steel and shall be commercial-grit blasted to SSPC-SP10, primed with one coat of aromatic urethane zinc-rich primer (2.5-3.5 mils DFT) followed by 4 - 5 mil DFT finish coat of Tnemec Endurashield, series 73 (11sf safety blue), applied in two passes with partial drying between passes (equals one high-build coat). Total coating system (primer plush finish) is 7.0 mil DFT minimum.

B. Approved supplier shall be Hoffman or equal.

4.6.2 OPERATOR INTERFACE TERMINAL (OIT)

A. The main control enclosure shall incorporate a graphical operator interface with a diagonal display length of 7 inches. The operator interface shall be programmed to display the system in line drawing form to allow clear visual confirmation of the system status. This interface shall allow the system to be started and stopped in automatic mode, display process variables and alarms, allow the user to adjust system set points, silence/acknowledge alarms, manually initiate automated processes (i.e. filtration, regeneration, integrity test, etc.), prompt the user in a step by step fashion during manual procedures (i.e. CIP procedures), and allow true manual operation of the system by allowing the user to position individual valves and control pumps.

B. In addition to the graphical OIT, the enclosure door shall contain the following devices, each containing a UL mark:

- Pilot light to indicate a general alarm condition
- Pilot light to indicate that instrumentation voltage is present

- Lighted QUICK stop pushbutton (lit when the Q-stop is engaged)
- Circuit breaker disconnect door latch

C. OIT shall be Allen-Bradley® PanelView™ Plus 6 700 - 7" Diagonal model or equal. Software shall be FactoryTalk™ View ME or equal.

4.6.3 PROGRAMMABLE LOGIC CONTROLLER

A. Mounted within the enclosure shall be the system's main controller. This shall be a commercially available programmable logic controller with sufficient I/O to automatically control the system's valves, send signals to operate the system's pumps, and receive input from the instruments included with the system. Provision shall be made for receiving input from the customer's instruments, allowing the system to accept signals from upstream or downstream equipment so that the system can be automatically stopped, started, or production rate changed based on the availability of feed water or filtrate storage space.

B. The control system shall include the following hardware.

1. PLC shall be Allen-Bradley® Logix 5000.
2. Local skid I/O shall be Festo CPX..
3. Power Supply shall be manufactured by Allen-Bradley®.
4. Terminal Blocks shall be manufactured by Allen-Bradley®.
5. Control enclosures shall be Hoffman or equal.
6. Control panel indicator lights and switches shall be Allen-Bradley®.
7. HMI Interface shall be PanelView™ by Allen-Bradley®.
8. Networking hardware shall be Phoenix Contact or equal.
9. Chemical, Hot water, Neutralization (CHN) System Hardware - Local panel with local I/O that is connected to the filtration skid via Ethernet/IP™. Local I/O: The CHN shall use Festo CPX series I/O products or equal.
10. Networking –For multiple skid systems, the control scheme shall be based on a single master PLC in a stand-alone panel with distributed I/O. The master PLC controls all filtration skid processes and devices. With multiple skids, the master PLC will control the processes and devices. The master PLC will be an Allen-Bradley® ControlLogix™ programmable logic controller. Each filtration skid will contain a manifold with Festo CPX I/O. Communication between the master PLC, HMI, and skids is handled via Ethernet/IP™. The standard master control enclosure must be located in close proximity to, and in full view of the filtration skids and contain a PanelView™ HMI.

4.6.4 NETWORK ACCESS

A. The MF system shall include an Ethernet connection port for connecting the system to the existing City and Borough of Juneau water system SCADA.

A PC-based SCADA option shall be provided. This option allows:

1) Enhanced capability for control and/or display of customer equipment.

2) Remote access to PLC through pcAnywhere™ software. Allows capability for remote troubleshooting and operation of the system.

3) Data reporting using Microsoft® Excel

4) Equipment Specifications:

a) A Dell PC (or equal) with necessary system requirements (based on most recent PC technology).

b) Software – Rockwell FactoryTalk™ View SE

4.7.5 ALARMS

A. Alarm conditions shall be displayed and acknowledged at the main OIT. An alarm condition shall also cause the alarm pilot light to be lit, and an audible horn mounted on the control panel shall sound. Controls shall be included to allow the operator to silence the horn, but the alarm will continue to be visually displayed until the alarm is corrected/acknowledged.

B. The following alarm conditions are included as a minimum:

- Q-stop
- Feed Pump Fault
- RF Pump Fault
- Lack of feed fluid/filtrate storage
- Low Air Pressure
- Integrity Test Failure
- Low/high RF tank level
- High/Low feed tank level
- CIP required (high Transmembrane Pressure)
- High turbidity
- High/low water temperature
- Level, pressure, flow, temperature transmitter failure

4.7.6 QUICK STOP

A. Once the Q-stop pushbutton is pressed (located on the control panel door), all pumps on the MF skid shall stop, and the system's inlet, outlet, and drain valves shall close. The system will not be able to operate again until the operator disengages the Q-stop button.

4.7.7 CONTROL ENCLOSURE WIRING

A. The main control panel shall be completely wired at the factory. Control enclosures shall be designed and constructed in accordance with UL 508A, and only by manufacturer's capable of listing equipment to UL 508A. All components within the control enclosure shall contain a UL mark and have termination points that are finger safe.

B. Power brought to the cabinet in the specified voltage only needs to be terminated at a circuit breaker disconnect switch that is interlocked to the enclosure door. A power supply shall be provided to convert the base voltage of the system to alternate voltages that may be required by components on the skid (120VAC, 24VDC, etc.).

C. A surge suppressor shall be included in the main enclosure to protect the power supply, the PLC and I/O modules, and the skid mounted valves and instruments from power surges.

D. Wiring within the panel shall be routed through plastic wire ways for neatness and organization. Where feasible, conductors for high (120 VAC and above) and low (24VDC) voltage shall remain separated. Copper wire shall be used and sized for its load per NEC/NFPA79 requirements. All wires will terminate through a ferrule type connector and terminate on finger safe, screw clamping terminal blocks.

4.8 ELECTRICAL WIRING

A. MF system shall be delivered completely pre-wired from the main control enclosure to solenoid valves and instruments. Wiring shall be copper, and sized for its load per NEC/NFPA79 requirements. All wires will terminate on screw clamping terminal blocks.

B. Wires from the main control enclosure shall be enclosed in conduit made of PVC or flex-tite style PVC conduit that is completely sealed from moisture. Where practical, low voltage control conductors (24VDC) shall be separated from those carrying high voltage power (120VAC and above).

4.9 INSTRUMENT AIR TUBING

A. Tubing is used to deliver instrument air to the valve actuators included on the system. Instrument air tubing shall be 1/4" diameter polyurethane. Reusable compression fittings shall be used in the instrument air system.

B. Instrument air for all purposes enter the system through a common air inlet line. Pressure adjustment shall be provided using adjustable pressure regulating valves manufactured by Monnier or equal. The main air intake line shall have a manual lockout valve to allow lockout of air to the system for valve maintenance.

4.10 PIPE AND FITTINGS

A. The MF system plumbing shall incorporate stainless steel, HDPE, or PVC pipe and fittings.

B. Stainless steel pipe shall conform to ANSI B36.19 and be constructed of schedule 10s austenitic stainless steel to ANSI A312 type 304, 304L, 316, or 316L. Only welders qualified to section IX of the ASME/ANSI boiler and pressure vessel code shall perform welding of SST pipes.

C. PVC pipe shall be NSF 61 approved Type 1 Grade 1 gray with compounds conforming to ASTM D-1784. Pipe and fitting wall thickness shall be schedule 40. Socket welded fittings shall be used whenever possible, using solvent bonding techniques.

D. Flanges shall use bolting patterns per ASME/ANSI B16.5

4.11 FRAME ASSEMBLIES

A. The MF system and modules shall be mounted on a steel framework fabricated primarily from square tubing. Exceptions to this are angles, plate, round pipe, or other structural shapes that may be welded to the tubing for use as legs or mounting brackets for pumps, instruments, and other components. Frame materials shall be seal welded together to prevent moisture from entering the welded joint or the interior of closed element such as tubing or pipe. Personnel performing welding shall be qualified to AWS 1.1.

B. Frame material shall be carbon steel. It shall be commercial grit blasted to SSPC-SP10 and primed with one coat of Tnemec 90-97 Tnemec-zinc, 2.5-3.5mil DFT. 4 - 5 mil DFT finish coat of Tnemec Endurashield, series 73 (11sf safety blue) shall be applied in two passes with partial drying between passes (equals one high-build coat).

C. The frame has legs with steel base plates for anchoring to a foundation (by others) using anchor bolts/nuts (by others).

4.12 EQUIPMENT OPTIONS

4.12.1 CHEMICAL, HOT WATER, NEUTRALIZATION (CHN) SKID

A. A CHN (Chemical, Hot water, Neutralization) system shall be provided. This system provides the following:

1. Warm water for CIP (Clean In Place) operations.
2. Provides EFM (Enhanced Flux Maintenance) capability.
3. Provides capability for automatic injection of CIP chemicals, if an automated CIP injection option is purchased.
4. Provides capability for automatic injection of chemicals to neutralize the CIP waste.

B. This system generally includes: a tank with an immersion heater, level control and temperature transmitter, a supply pump to transfer the water to the system feed/recirculation tank, air driven diaphragm chemical pump, solenoids, control panel to control the operation and communicate with the AP or master control system, and the various valves, injection ports, piping, and wiring required. The supply pump, valving, injection ports, control panel, etc., are skid mounted, with interconnect piping included to connect to the free-standing warm water tank. The chemical pump is mounted on a plate and shipped loose so that it can be located directly on a chemical drum or tote.

C. Equipment used for the CHN skid shall be as follows:

a. Tank vertical round style, HDPE tank manufactured by Snyder or equal.

b. Tank heater shall be Hubbell V1645T4XX circulation heater or equal. Material shall be 304 L SS.

c. Warm water transfer pump capable of providing the desired flow rate and pressure.

d. Solenoid Valves shall be 5/2-way and 3/2-way as manufactured by Festo or equal.

e. Flow switch shall be Harwill paddle style with socket weld PVC or equal.

f. Chemical transfer pumps shall be diaghram, air operated. Pumps shall produce the desired flow rate and pressure with an air consumption of 5 SCFM max.

g. Actuated valves shall be Tyco/Keystone 222LT Lug-Style Butterfly with cast iron body, 316 SS disc and stem, and EPDM Food Grade Seat or equal. Spring return actuator shall be Keystone/Morin 79U Spring Return Pneumatic – Rack and Pinion. Dual Acting actuator shall be Keystone/Morin 79U Dual Acting Pneumatic – Rack and Pinion or equal.

h. Manual Valves

   a. Ball valves shall be Spears 3629 socket weld with PVC body and EPDM gaskets or equal.

   b. Gate valve shall be Spears 2022 socket weld with PVC body and EPDM O-ring or equal.

i. Check Valves

   a. Butterfly valves shall be Spears 542G-020 PVC or equal(2 in.)

   b. Poppet valves shall be FLO 1790-C20 PVC or equal(2 in.)

j. Level Transmitter shall be Rosemount 2088 0-30 PSI with LCD display. Wetted parts shall be 316L SST or equal.

k. Temperature transmitter shall be Rosemount RTD with 316 SS thermowell or equal.

l. Injection Valve shall be LMI Chem Injector/check valve #38026 or equal.

m. Foot valve shall be Jaco Kynar Ball check valve with Hastelloy Spring, Buna N O-Ring and Teflon Ball or equal.

4.12.2 CIP TRANSFER/INJECTION

A. Chemical Transfer pumps shall be Diaphragm style and air operated.

1. Pumps shall produce the desired flow rate and pressure consuming a maximum 5 SCFM air.
2. Foot valve shall be Jaco Kynar Ball Check Valve with Hastelloy Spring, Viton O-Ring, and Teflon ball or equal.
3. Injection valve shall be LMI Chem Injector/check valve #38026 or equal.
4. Approved manufacture shall be Wilden or equal.

4.12.3 AIR COMPRESSOR SYSTEM

The MSS shall provide an air compressor system to meet the air requirements of their system. The system shall consist of of a rotary screw compressors (dual system required for redundancy) and a receiver tank, along with associated filters, gauges, relief valves, drains, etc., required for a complete air supply system.

The compressor shall be as the follows or equal:

Manufacturer	Atlas Copco
Model	GX – series Full Featured w/Enclosure
Type	Single Stage Oil Flooded Rotary Screw
Features	Inlet Air Filter Integrated Refrigerated Dryer TEFC Motor Differential Pressure Oil System with Oil Cooler Air/Oil Separator with Oil Level Sight Glass Oil Filter V-Belt Drive with Tensioning Device Load/No Load Capacity Control Sound Attenuating Enclosure - CSA/UL Appr. Factory Oil Fill-Food Grade Oil Electro-pneumatic start/stop control Motor Starter Mounted and Prewired Emergency Stop Button After-cooler & Moisture Separator Dew-point Gauge Sound level ≤ 70 db

<u>External Filters (installed separately)</u>

DDX Coalescing Filter	0.1 ppm oil/water, 1 micron filter
PDX Coalescing Filter	0.01 ppm oil/water, 0.01 micron filter

<u>Receiver</u>

Manufacturers	Silvan or Manchester
Type	Vertical
Rating	ASME Coded 200 psi
PRV	¼-inch 200 psi 178 scfm

Pressure Gauge	4-inch 0-200 psi
Drain Valve	½-inch ball valve

4.12.4 TURBIDIMETERS

Turbidimeters shall be provided to measure and report the turbidity (in NTU) of the feed and filtrate. The turbidimeters shall be mounted on the skid, with feed and filtrate ports already installed,. The turbidimeters use a Hach SC-100 controller with display with 4-20mA signal to the MSS control system PLC. A Hach 1720E turbidimeter shall be used on the feed and the Hach FilterTrak 660 Laser Nephelometer shall be used for filtrate.

Hach 1720E Specifications:

Range	0.001 – 100 NTU
Accuracy	0 – 10 NTU +/- 2% of reading or 0.015 NTU
	10 – 40 NTU +/- 5% of reading
	40 – 100 NTU +/- 10% of reading
Sample Flow	200 – 750 ml/min
	Built-in Bubble Removal Included
Controller	Hach SC-200
Power	100 – 230Vac 50/60 Hz Auto Selectable
Controller Enclosure	Nema 4X
Output	4-20 mA

Hach FilterTrak 660 Specifications

Range	0 – 1000 mNTU (0 - 1NTU)
Accuracy	+/- 5% of Reading
Sample Flow	100 – 750 ml/min
	Built-in Bubble Remover Included
Controller	Hach SC-200
Power	100 – 230Vac 50/60 Hz Auto Selectable
Controller Enclosure	Nema 4X
Output	4-20 mA

4.12.5 UNINTERRUPTIBLE POWER SUPPLY (UPS)

A. A UPS (Uninterruptible Power Supply) is to be provided to prevent loss of power. The UPS shall provide 30 minutes of power to the master PLC during a short-term power outage, allowing the system to restart automatically.

B. UPS shall be 1kVa, 120V manufactured by Eaton Powerware or 240W, 24V manufactured by Allen-Bradley® or equal.

4.12.6 SCADA OPTION

A. A PC-based SCADA option shall be provided. This system shall allow:

Enhanced capability for control and/or display of customer equipment
Remote access to PLC through pcAnywhere™ to allow remote troubleshooting and operation of the system

Data Reporting using Microsoft® Excel

Equipment Specifications:

Dell PC (or equal) with necessary system requirements (based on most recent PC technology)

4.12.7 ALARM DIALER

A. An alarm dialer shall be provided to alert plant personnel of critical alarms by dialing a pre-set list of phone numbers. The system PLC will activate the alarm dialer when specific critical alarms occur. The alarm dialer will notify the call recipient of the alarm information through a voice-synthesized message, and a user may call in to receive a status. The details are as follows:

Manufacturer	RACO
Model	Guard-IT™ 200GI-4 or Verbatim™ 300VSS-8C or equal
Enclosure	NEMA 4X

4.12.8 NEUTRALIZATION SYSTEM

A. A Neutralization System shall be provided to collect the CIP waste solutions and adjust the pH to an acceptable range before discharging to waste. The system shall generally consists of an HDPE tank, pump to mix solution in tank and discharge neutralized solution to waste, level transmitter, pH sampling port, chemical addition for neutralization, and a CIP Waste Collection and Transfer System to transfer the CIP chemical solutions from the modules to the Neutralization tank.

B. The system shall generally consists of the following, actual sizing/equipment must be determined based on the actual application:

Tank - approx. 4000-6000 gal HDPE with fittings (size depends on site specific requirements)
Neutralization and Waste Discharge Pump
Waste Collection and Transfer Sump includes HDPE tank and 0.5 HP Pump (115 VAC)
Level Transmitter for Neutralization Tank
Chemical Addition Supplied by optional CHN system
pH Sample Port in Circulation Piping

ATTACHMENT 3 to APPENDIX A
SCOPE OF SERVICES

LIST OF SPARE PARTS

Pall Tag Number	Description	Material Master	Valve Type	Size	Recommended Spares
HV1101/HV1201	FEED SAMPLE VALVE	WH017021	BALL	0.5"	1
N/A	KIT,REPAIR STRAINER SAF 6000 DRIVE	WH032779		10"	1
N/A	KIT,REPAIR STRAINER ,10" SAF 6000	WH028124		10"	1
H5101	Tank Heater	WH014339	Immersion		1
CV5101/CV5103A/CV5103B/CV5104A/CV5104B/CV5105A/CV5105B/CV5106A/CV5106B	CHEMICAL INJECTION CHECK VALVE/SODIUM HYPOCHLORITE FOOT VALVE/SODIUM HYPOCHLORITE CHECK VALVE/SODIUM HYDROXIDE FOOT VALVE/SODIUM HYDROXIDE CHECK VALVE/CITRIC ACID FOOT VALVE/CITRIC ACID CHECK VALVE/SODIUM BISULFITE FOOT VALVE/SODIUM BISULFITE CHECK VALVE	WH035013	CHECK	1/2"	2
HV1102/HV1202/HV1104/HV1204	TURBIDITY SAMPLE VALVE/TURBIDITY INSTRUMENT INLET VALVE	WH040874	BALL	0.375	1
V1123/V1223	TURBIDITY INSTRUMENT INLET	WH059698	DIAPH	0.25	1
CV1101/CV1201	AIR SCRUB CHECK VALVE	WH080332	CHECK	3	1
P90/P91/P92/P93	Chemical Transfer Pump	WH101090	Air Operated Double	0.25"	1
S5101	CIP Circulation Strainer	WH171512	Basket		1
V1198/V1298/V313Y/V323YV119Y/V1219Y/V117Y/V127Y/V113Y/V123Y/V1111Y/V1211Y/V115Y/V125Y/V8101	FEED HEADER FLUSH VALVE, NON-CHEMICAL	WH200120	BTFL	2	1
HV8101/HV8102	FEED STRAINER INLET/FEED STRAINER DISCHARGE	WH200225	BTFL	10	1
V1102/V1202/V1105/V1205/V118Y/V128Y/V116Y/V126Y	CIP FEED/DRAIN ISOLATION//CIP RETURN/CIP FEED/DRAIN BLOCK VALVE/CIP RETURN BLOCK VALVE	WH200125	BTFL	4	1
V1103/V1203/V1106/V1206/V1107/V1207/V312Y/V322Y/V112Y/V122Y/V114Y/V124Y	FILTRATE/NON-CHEMICAL DRAIN/RF INLET/FEED BLOCK VALVE/FILTRATE BLOCK VALVE/REVERSE FLUSH BLOCK VALVE	WH200127	BTFL	6	1
V1104/V1204/V1115/V1215/V1110Y/V1210Y/V5101/V5102/V5103/V5104/V5105/V5106/V5108/V5109	FILTRATE CIP RETURN/AIR SCRUB ISOLATION/FILTRATE CIP RETURN BLOCK VALVE/CIP PUMP DISCH TO RACK/CIP WATER SUPPLY/CIP SKID INLET VALVE/CIP SOLUTION RETURN TO TANK/CIP SOLUTION RETURN FROM RACK/CIP PUMP DISCH TO CIP TANK or RACK/CIP CHEMICAL DRAIN/CIP RETURN TO CIP PUMP SUCTION	WH200136	BTFL	3	2
V1109/V1209	LOWER DRAIN VALVE	WH200137	BTFL	4	1
FCV1101/FCV1202/FCV9101	FEED INLET/RF SUPPLY	WH200183	MODULATING BTFL	6	1
HV6108/HV6208	ASRF AIR SUPPLY VALVE	WH200222	BTLF	3	1
V1119/V1219/V1122/V1222	FILTRATE VENT VALVE/XR VENT VALVE	WH200353	DIAPH	0.75	1
V5113/V5114	SODIUM HYPOCHLORITE SUPPLY/SODIUM HYDROXIDE SUPPLY	WH200355	DIAPH	1/2"	1

ATTACHMENT 3 to APPENDIX A
SCOPE OF SERVICES

LIST OF SPARE PARTS

V5107/V5115/V5116	CIP SOLUTION SLIP STREAM SAMPLE VALVE/CITRIC ACID SUPPLY/SODIUM BISULFITE SUPPLY	WH200356	DIAPH	1/2"	1
V1120/V1220	IT AIR INLET	WH200357	BTFL	1	1
P5101A	CIP Circulation Pump	WH301558	Horizontal End Suction		1
N/A	CIP CIRCULATION PUMP REPAIR KIT	WH015433			1
HV6103A/B	AIR COMPRESSOR DISCHARGE	WH200123	BTFL	2"	1
FCV6101A/B	AIR SCRUB FLOW CONTROL	WH200180	BTFL	2"	1
CV6102/CV6103	AIR SCRUB CHECK VALVES	WH080348	CHECK	2"	1
HV1103/HV1203/HV 6102, HV6114, HV6103A/B, HV6101A/B, HV6105A,/B	SOLENOID BANK AIR INLET VALVE/PI6102 ISOLATION VALVE/RECEIVER DRAIN VALVE/PI6103A/B, PI6101A/B, PI6105A/B ISOLATION VALVES		BALL	1/2"	1
HV6106A/B, HV6107A/B	CONTROL AIR ISOLATION VALVES		BALL	1"	1
HV6120A/B, HV6127A/B	INTEGRITY TEST AIR ISOLATION VALVES		BALL	1 1/2"	1
HV6115, HV6117, HV6120A/B, HV6121A/B, HV6122A/B	RECEIVER INLET/DISCHARGE ISOLATION VALVES/AIR SCRUB AIR ISOLATION VALVES		BALL	2"	1
PHC-6101A/B	CONTROL AIR PRESSURE REGULATOR			1"	1
PHC-6102A/B	INTEGRITY TEST AIR PRESSURE REGULATOR			1 1/2"	1
PHC-6102A/B	AIR SCRUB AIR PRESSURE REGULATOR			2"	1
NO TAG	PIT6101 ISOLATION/CALIBRATION MANIFOLD	WH013642		1/2"	1
PRV-6101	Receiver pressure relief valve	WH030848		1/2"	1
FIT-6101 (A/B)	Air Scrub Flowmeter	WH031989			1
PI-6101 (A/B)/PI-6105 (A/B)	Air Scrub Air Supply Pressure Gauge/IT Air Supply Pressure Gauge	WH043786			1
PI-6103 (A/B)	Valve Air Supply Lines Pressure Gauge	WH049094			1
PI-6102	Air Receiver Pressure Gauge	WH050064			1
FI-TBD	MF Rack Filtrate Turbidimeter Flow Indicator	WH061351			1
AIT-1101/1201	MF Rack Filtrate Water Turbidimeter	WH066041			1
PIT-6101	Air Receiver Pressure Transmitter	WH068361			1
PIT-1101/1201, PIT-1102/1201	MF Rack Feed Water Pressure Transmitter	WH068362			1
FIT-1101/1201, FIT-4101	Water Flowmeter - 6 INCH	WH167099 (Sensor) WH078928 (Transm.)			1
LT-5101	CIP Tank Level Transmitter	WH010746			1
TT-5101/TT-5102	CIP Tank Temperature Transmitter, 18" Immersion Length Probe & Alloy 20 Thermowell	WH058857			1
PS-6101, PS6102A/B	Valve Air Pressure Switch				1

ATTACHMENT 3 to APPENDIX A
SCOPE OF SERVICES

LIST OF SPARE PARTS

NO TAG	PLC COMP,INPUT MOD,16CHAN	WH010891			1
NO TAG	FUSE,0.1AMP,TYPE T,5X20MM	WH012400			5
NO TAG	FUSE,2AMP,TYPE T,5X20MM	WH012452			5
NO TAG	FUSE,0.5AMP,TYPE T,5X20MM	WH012482			5
NO TAG	FUSE,10AMP,TYPE T,5X20MM	WH012510			5
NO TAG	FUSE,3.15AMP,TYPE T,5X20MM	WH012557			5
NO TAG	FUSE,1AMP,TYPE T,5X20MM	WH012568			5
NO TAG	RELAY,CONTROL,6A,24VDC,SLIMLINE,SPDT	WH012864			1
NO TAG	ENCLOSURE, LIGHT,DOOR SWITCH	WH019421			1
NO TAG	PLC COMP,ANALOG INPUT,8CHANNEL	WH023992			1
NO TAG	PLC COMP,ANALOG OUTPUT, 8CHANNEL	WH025468			1
NO TAG	PLC COMP,OUTPUT MOD,8CHAN	WH026293			1
NO TAG	ETHERNET SWITCH,4 PORT SWITCH	WH030690			1
NO TAG	ELEC COMP,ETHERNET W/GFCI/3A BRKR	WH034233			1
NO TAG	RELAY,CONTROL,10A,120VAC,SLIM,DPDT	WH036571			1
NO TAG	POWER SUPPLY,240W,120VAC/24VDC,10A,SL	WH041555			1
NO TAG	ENCLOSURE,12" LIGHT,FLR BULB	WH041647			1
NO TAG	PLC COMP,COMPACTLOGIX PWR SPPLY,24VDC	WH049430			1
NO TAG	POWER SUPPLY,UPS,1KVA,120ACX120AC	WH064647			1
NO TAG	18" LIGHT FIXTURE,FLUORESCENT	WH065507			1
NO TAG	PILOT LIGHT,N4X,AMBER,PTT, LED	WH100689			1
NO TAG	PILOT LIGHT,N4X,WHITE,PTT, LED	WH100690			1
NO TAG	PLC,COMPACTLOGIX 1769-L36 CPU 3MB	WH100903			1
NO TAG	CIRCUIT BREAKER,15A,1 POLE,120/240VAC	WH101783			1
NO TAG	CIRCUIT BREAKER,20A,1 POLE,120/240VAC	WH101784			1
NO TAG	OIT,EXOR,17",1.46GHZ,8GB,W7,24VDC,WIFI	WH102488			1
NO TAG	NETWORK ADDRESS TRANSLATION DEVICE	WH102616			1
	Total Recommended Spares	**$89,958.00**			

ATTACHMENT 4 to APPENDIX A
SCOPE OF SERVICES

WARRENTY

PALL WARRANTY FOR HARDWARE, MODULES, AND SERVICES

A. Seller warrants to Buyer that the title to the goods conveyed shall be proper, its transfer rightful, and free from any security interest, lien, or other encumbrance upon delivery. Seller shall defend, indemnify, and hold Buyer harmless against any liens, claims, or demands to the extent caused by a breach of the foregoing warranty.

B. Limited Warranties

1. Limited Hardware Warranty:
   Seller warrants to Buyer that for a period of twelve months commencing from the date of start-up or eighteen months from time of delivery from Seller, whichever is sooner, (the "**Warranty Period**"), that the goods manufactured by Seller, when properly installed and maintained, and operated at ratings, specifications and design conditions specified by Seller, will meet Seller's specifications for such goods and will be free from material defects in material and workmanship (this "**Limited Warranty**").
   If the defects are of such type and nature as to be covered by this Limited Warranty, Seller shall, at its option and in its sole discretion, either:

   (a) accept return of the defective goods and furnish a replacement goods; or
   (b) furnish replacement parts for the defective goods; or
   (c) repair the defective goods; or
   (d) accept return of the defective goods and return payments made, or issue credits for, such defective goods.

2. Limited Module Warranty:
   (10 YEAR - 3 YEAR ABSOLUTE AND 7 YEARS PRO-RATED)

   a. In addition to the foregoing, for a period of 120 months commencing from the date of the startup, or 126 months from the date of delivery from Seller (the "**Module Warranty Period**"), whichever is sooner, Seller warrants that the membrane modules, when properly installed and maintained, and operated at ratings, specifications and design conditions, will be free from defects in material and workmanship. In addition, Seller warrants satisfactory performance of each membrane module based on the microfilter system's ability to support design flow rates and the membrane modules passing the Seller's standard integrity test.

   b. Owner and Seller will work together to optimize the specific operating protocol to be used including number of racks on line, flow rates per rack, cleaning technique and cleaning set points with the goal of achieving excellent long-term performance. Any change in operating conditions, water chemistry or the nature of the contaminants will require a review to determine the potential for impact on this warranty.

c. If the membrane modules fail to perform as outlined during the first 36 months of the Module Warranty Period, Seller will be given the opportunity to remedy the situation, for example, by modifying operating and/or cleaning protocol. If Seller is not able to remedy the situation, Seller will repair or replace those modules that do not perform if they are removed from service due to poor performance.

d. If the membrane modules fail to perform as outlined after the first 36 months of the Module Warranty Period through the end of the Module Warranty Period, Seller will be given the opportunity to remedy the situation, for example, by modifying operating and/or cleaning protocol. If Seller is not able to remedy the situation or repair the modules, Seller will replace those modules at the following replacement price:

Replacement Module Price = Seller's current module price * (# of months from startup / 120 months)
Or
Replacement Module Price = Seller's current module price * ((# of months from delivery – 6) / 120 months))

e. Seller is committed to continuous development of its filters and filter processes. Should membrane technology improve, for example via changes in the permeability or operating flux rates of the membranes, Seller reserves the right to provide a suitable number of alternative membrane replacements during the term of our warranty and beyond.

f. Seller's liability under this Limited Membrane Warranty is limited solely (in Seller's discretion) to replacing (FOB original ship point), repairing or issuing credit for products that become defective during the Module Warranty Period.

3. Limited Warranty for Services:

Seller further warrants that the services, if any, will be performed in a workmanlike manner in accordance with applicable law and industry standards by qualified personnel (this "**Limited Warranty for Services**"); this Limited Warranty for Services shall survive for 30 days following Seller's completion of the services (the "**Service Warranty Period**"). In the event of a warranty claim under this Limited Warranty for Services, Buyer shall inform Seller promptly in writing of the details of the claim within the Service Warranty Period. Seller's liability under any service warranty is limited (in Seller's sole discretion) to repeating the service that during the Service Warranty Period does not meet this Limited Warranty for Services or issuing credit for the nonconforming portions of the services. If Seller determines that any warranty claim is not, in fact, covered by the foregoing Limited Warranty for Services, Buyer shall pay Seller its then customary charges for all services performed by Seller.

C. Seller's warranty hereunder excludes, and in no event shall Seller be liable for, defects or damage arising out of or caused by:

1. abuse, improper modification, improper maintenance, improper installation, or improper operation by persons other than Seller; or

2. corrosion or chemical attack, unless corrosive or chemically-damaging conditions were disclosed by Buyer in the contract documents and the contract documents required the goods to withstand such conditions; or
3. use in a manner contrary to Seller's written instructions for installation, operation, and maintenance or negligence of persons other than Seller; or
4. normal wear and tear under normal usage; or
5. operation of the equipment at pressures during forward flow, air scour and reverse flow modes higher than those recommended in the O&M Manual; or
6. foreign debris, casualty, or accident.

In no event shall Seller be liable for any goods repaired or altered by someone other than Seller other than pursuant to written authorization by Seller.

D. Buyer shall promptly notify Seller of any breach of Seller's warranties within the applicable Warranty Period and provide Seller with an opportunity to inspect and test the goods or services claimed to fail to meet the above Limited Warranties. Buyer shall provide Seller with a copy of the original invoice for the product or service, and prepay all freight charges to return any goods (or parts thereof) to Seller's factory, or other facility designated by Seller. All claims must be accompanied by full particulars, including operating conditions, if applicable. If Seller determines that any warranty claim is not, in fact, covered by the foregoing Limited Warranties, Buyer shall pay Seller its then customary charges for any additionally required service or products.

E. THIS WARRANTY IS EXCLUSIVE. THE LIMITED WARRANTY AND THE LIMITED WARRANTY FOR SERVICES ARE THE SOLE AND EXCLUSIVE OBLIGATIONS OF SELLER WITH RESPECT TO THE DEFECTIVE GOODS AND SERVICES. SELLER SHALL NOT HAVE ANY OTHER OBLIGATION WITH RESPECT TO THE GOODS, SERVICES, OR ANY PART THEREOF, WHETHER BASED ON CONTRACT, TORT, STRICT LIABILITY, OR OTHERWISE. THE REMEDIES SET FORTH ABOVE SHALL BE THE BUYER'S SOLE AND EXCLUSIVE REMEDY AND SELLER'S ENTIRE LIABILITY FOR ANY BREACH OF THE LIMITED WARRANTY SET FORTH HEREIN EXCEPT FOR THE WARRANTIES SET FORTH IN THIS SECTION, SELLER MAKES NO WARRANTY WHATSOEVER WITH RESPECT TO THE GOODS AND SERVICES, INCLUDING WITHOUT LIMITATION ANY (a) WARRANTY OF MERCHANTABILITY; (b) WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE; (c) WARRANTY OF TITLE; OR (d) WARRANTY AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OF A THIRD PARTY; WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE.

F. In no event shall Buyer be entitled to claim under the above Limited Warranties if Buyer is in breach of its obligations, including but not limited to payment, hereunder.

ATTACHMENT 5 to APPENDIX A
SCOPE OF SERVICES

PROJECT SCHEDULE

PROPOSED JUNEAU PROJECT SCHEDULE

Milestone	Estimated Date	Duration Required	
Bids Due	11/19/2014		
Bid Validity	3/19/2015	120	days from bid
Order Acknowledgement or Notice of Award	1/26/2015	68	days from bid
Submittal	2/16/2015	21	days from Order Acknowledgement or NOA
Submittal Approval	3/9/2015	21	days from Submittal
Mat'l/Fabrication Release	3/16/2015	7	days from Submittal Approval
Equipment Delivery	7/14/2015	120	days from Mat'l/Fabrication Release
Installation Complete	9/12/2015	60	days from Equip Delivery
Start Commissioning	9/12/2015	0	days from Install Complete
Start-up Complete	9/28/2015	16	days from Commissioning Start
System Acceptance	10/1/2015	3	days from Commissioning Complete
Contract Requirement for Completion	10/1/2015	248	days from Order Acknowledgement

Submittal Schedule

Within 10 Days from Order Acknowledgement OR Notice of Award

- P&ID (FOR APPROVAL)
- General Arrangement Drawings for Pall-Supplied Equipment (FOR INFO ONLY)
- Electrical Interconnect Drawing (Power One-Line, I/O Interconnection and Network Layout) (FOR APPROVAL)

Within 21 Days From Order Acknowledgement OR Notice of Award (FOR INFO ONLY)

- Electrical Drawings for Pall-Supplied Panels
- Mechanical Replacement Parts List
- Electrical Replacement Parts List
- Compressed Air System Information
- AP Skid Installation Manual
- Cutsheets for Pall-Supplied Off-Skid Components
- Installation & Startup Checklist

Delivered at Time of Equipment Shipment

- Operation & Maintenance Manual
- Software License Transfer Documentation

APPENDIX B

COMPENSATION

The membrane filtration system and associated materials and required services outlined in this contract will be provided for the **Lump Sum** price of **$1,022,440.00** (shipping included), consisting of $932,482.00 for the Aria™ FIT system as described in this contract plus $89,958.00 for maintenance and spare part items.

Assignment of Contract

Subsequent to the award of this contract CBJ intends to bid and award a general construction contract for the Salmon Creek Water Treatment Plant at which time this contract and the agreed upon terms and conditions will be assigned to a general construction contract. The contract between CBJ and Pall will dissolve and the Pall will enter into a contractual relationship with the General Contractor for the project. This arrangement will be similar in all respects to any other equipment supplier relationship established by the General Contractor.

Payment Schedule

The City shall pay all invoiced amounts due to Membrane Filter Supplier within 30 days from the date of receipt of invoice. Such payment shall be made by EFT, wire transfer, or check and in US dollars.

The CBJ will provide payment for the Membrane System to the General Contractor on the following schedule:

- 10% Upon Notice to Proceed for General Construction Contract and Receipt of Complete Submittal Package
- 10% Upon Approval of Submittals and Receipt of ADEC Plan Review Approval of the Membrane Filtration System provided Notice to Proceed has been issued for General Construction Contract
- 25% Upon Notice to Commence Fabrication of Equipment
- 40% Upon Successful delivery of Membrane Filtration System to Juneau project site
- 10% Upon Successful Complete Installation, Start-Up Testing, Operator Training and Beneficial Use of the Membrane Filtration system
- 5% Upon receipt of final Approval to Operate from Alaska Department of Environmental Conservation or 45 days from start of Beneficial Use if Pall has supplied all documentation etc. required by ADEC to grant final Approval to Operate, whichever is soonest.

APPENDIX C

INSURANCE REQUIREMENTS

The following insurance requirement would be required of the MSS should an agreement between the MSS and General Contractor for on-site services beyond that of a normal material supplier. These requirements will not be required of the MSS for execution of the professional services contract between the CBJ and the MSS.

The MSS must provide certification of proper insurance coverage or binder to the City and Borough of Juneau. The certificate of insurance supplied to the City shall state that the City is named as **"Additional Insured for any and all work performed for the City & Borough of Juneau."** The Additional Insured requirement does not apply to Professional Liability and Workers Compensation insurance. Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions. The City no longer requires certificates of insurance referencing project names and contract numbers. Proof of the following insurance is required before award:

Commercial General Liability Insurance. The MSS must maintain Commercial General Liability Insurance in an amount it deems reasonably sufficient to cover any suit that may be brought against the MSS. This amount must be at least one million dollars ($1,000,000.00) per occurrence, and two million dollars ($2,000,000.00) aggregate.

Professional Liability Insurance. The MSS must maintain Professional Liability Insurance in an amount not less than one million dollars ($1,000,000.00) aggregate to protect the MSS from any claims or damages for any error, omission, or negligent act of the MSS, the MSS's firm and employees. This requirement applies to the MSS's firm, the MSS's subcontractors and assignees, and anyone directly or indirectly employed to perform work under this contract.

Workers Compensation Insurance. The MSS must maintain Workers Compensation Insurance to protect the MSS from any claims or damages for any personal injury or death which may arise from services performed under this contract. This requirement applies to the MSS's firm, the MSS's subcontractors and assignees, and anyone directly or indirectly employed to perform work under this contract. The MSS must notify the City as well as the State Division of Workers Compensation immediately when changes in the MSS's business operation affect the MSS's insurance status. Statutory limits apply to Workers Compensation Insurance. The policy must include employer's liability coverage of one hundred thousand dollars ($100,000.00) per injury, and five hundred thousand dollars ($500,000.00) policy limits. This policy shall be endorsed to waive all rights of subrogation against the City.

Comprehensive Automobile Liability Insurance. The coverage shall include all owned, hired, and non-owned vehicles to a one million dollar ($1,000,000.00) combined single limit coverage.

APPENDIX D

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS: That we Pall

a Corporation

hereinafter called "Principal" and _____
(Surety)

of _____, State of _____hereinafter called the "Surety," are held and firmly bound to the CITY AND BOROUGH OF JUNEAU, ALASKA hereinafter called "OWNER," (Owner) (City and State)

for the penal sum of One Million, Twenty Two Thousand, Four Hundred Forty dollars ($1,022,440.00) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the CONTRACTOR has entered into a certain contract with the OWNER, the effective date of which is _____, a copy of which is hereto attached and made a part hereof for:

NOW, THEREFORE, if the Principal shall truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof, which may be granted by the OWNER, with or without notice to the Surety, and if it shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the WORK to be performed thereunder or the specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the Specifications.

PROVIDED, FURTHER, that no final settlement between the OWNER and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is issued in two (2) identical counterparts, each one of which shall be deemed an original.

MEMBRANE SYSTEM SUPPLIER:

By:_____
(Signature)

_____
(Printed Name)

_____
(Company Name)

_____
(Street or P.0. Box)

_____
(City, State, Zip Code)

SURETY:

By: _____ Date Issued:_____
(Signature of Attorney-in-Fact)

_____
(Printed Name)

_____
(Company Name)

_____
(Street or P.0. Box)

_____
(City, State, Zip Code)

(Affix SURETY'S SEAL)

NOTE: If CONTRACTOR is Partnership, <u>all</u> Partners must execute bond.

APPENDIX E

STATE OF ALASKA
DEPARMENT OF ENVIRONMENTAL CONSERVATION
STATE DRINKING WATER LOAN PROGRAM

American Iron and Steel Requirement of the Consolidated Appropriations Act of 2014 (Public Law 113-76)

The CBJ is utilizing Alaska Department of Conservation (ADEC) State Drinking Water Loan Program Funds as partial funding for this project. As a requirement, the project must follow the buy *American Iron & Steel (AIS) Requirement of the Consolidated Appropriations Act of 2014 (Public Law 113-76).* Documentation of the requirements for the AIS are provided on the ADEC Municipal Loans website: http://dec.alaska.gov/wateR/muniloan/forms.htm

While water filtration equipment is exempt from the AIS, this information is provided in the event that an agreement is formed between the MSS and General Contractor to supply products beyond water filtration equipment that would be regulated under the AIS.

The CBJ intends to use the STEP process referenced within the AIS documentation. The documents will be included in the bid documents / construction contract for the Salmon Creek water filtration.

APPENDIX F

ALASKA LABOR STANDARDS, REPORTING AND PREVAILING WAGE RATE DETERMINATION

The following Alaska Labor Standards, reporting and prevailing wage rate determination requirements would be required of the MSS should an agreement between the MSS and General Contractor for on-site services beyond that of a normal material supplier. These requirements will not be required of the MSS for execution of the professional services contract between the CBJ and the MSS.

1. CERTIFIED PAYROLLS

   A. All CONTRACTORs or Subcontractor who perform work on a public construction contract for the OWNER shall file a certified payroll with the Alaska Department of Labor before Friday of each week that covers the preceding week (Section 14-2-4 ACLA 1949; am Section 4 ch 142 SLA 1972).

   B. In lieu of submitting the State payroll form, the CONTRACTOR's standard payroll form may be submitted, provided it contains the information required by AS 36.05.040 and a statement that the CONTRACTOR is complying with AS 36.10.010.

   C. A contractor or subcontractor, who performs work on public construction in the State, as defined by AS 36.95.010(3), shall pay not less than the current prevailing rate of wages as issued by the Alaska Department of Labor before the end of the pay period. (AS 36.05.010).

2. PREVAILING WAGE RATES

   A. Wage rates for Laborers and Mechanics on Public Contracts, AS 36.05.070. The CONTRACTOR, or Subcontractors, shall pay all employees unconditionally and not less than once a week. Wages may not be less than those stated in Paragraph 16.8C, regardless of the contractual relationship between the CONTRACTOR or Subcontractors and laborers, mechanics, or field surveyors. The scale of wages to be paid shall be posted by the CONTRACTOR in a prominent, easily accessible place at the site of the WORK.

   B. Failure to Pay Agreed Wages, AS 36.05.080. If it is found that a laborer, mechanic, or field surveyor employed by the CONTRACTOR or Subcontractor has been, or is being, paid a rate or wages less than the established rate, the OWNER may, by written notice, terminate the CONTRACTOR or Subcontractors right to proceed with the work. The OWNER may prosecute the work to completion by contract or otherwise, and the CONTRACTOR and sureties will be held liable to the OWNER for excess costs for completing the WORK. (Section 2 ch 52 SLA 1959).

C. Listing Contractor's Who Violate Contracts, AS 36.05.090. In addition, a list giving the names of persons who have disregarded the rights of their employees shall be distributed to all departments of State government and all political subdivisions. No person appearing on this list, and no firm, corporation, partnership or association in which the person has an interest, may work as a CONTRACTOR or Subcontractor on a public construction contract for the State, or a political subdivision of the state, until three years after the date of publication of the list. (Section 3 ch 52 SLA 1959; am Section 9 ch 142 SLA).

3. EMPLOYMENT REFERENCE. Workers employed in the execution of the contract by the CONTRACTOR or by any Subcontractor under this contract shall not be required or permitted to labor more than 8 hours a day or 40 hours per week in violation of the provisions of the Alaska Wage and Hour Act, Section 23.10.060.

CITY/BOROUGH OF JUNEAU
ALASKA'S CAPITAL CITY

Engineering Department

CONTRACT CHANGE ORDER NO. 1
Contract No. RFP E15-065

Contract Title:	Supply and Installation Assistance Salmon Creek Water Plant Membrane Filters				
Contractor Name:	Pall Corporation			CIP No.	
Purchase Order No.:		PAC:	414900101	750440130	
Date:	3/19/15			File No.	1686

Reference Item No.	Item Description	Unit of Measure	Unit Cost	Quantity	Increase/ (Decrease)
No. 1	CO 1 - RF Pump and Tank - Additional ***Change Order 1 to add equipment to the filtration package. CBJ will transfer this contractual relationship to the General Contractor for the project after award of the construction bid.***		$44,280.00		Increase
	TOTAL Increase/(Decrease)in Contract Amount				44,280

Original Contract Completion Date:	1-Oct-2015
Days added/subtracted by previous change order:	None
Days added/subtracted for this change order:	
Revised Contract Completion Date:	

This document is an amendment to the contract and all provisions of the contract shall apply hereto:

Accepted by the Contractor: Terry Cowley

Terry Cowley — PILOT — 4/17/2015

Name: Contractor's Title: Date:

Description	Signature	Date
Project Manager	N/A	3-23-2015
Client Department Representative		
Chief CIP Architect/Engineer		4/9/15
Engineering Contract Administrator		4/10/15
Funding Available		

Approved by CBJ City-Borough Manager Kimberly A. Kiefer — 5/22/15

Kimberly A. Kiefer — Date

CHANGE ORDER COST SUMMARY	
	Amount
Original Contract Bid Amount	$1,022,440
Change Order No. 1	$ 44,280.00
Total of All Change Orders	**$ 44,280.00**
Percentage of Original Contract bid Cost	$ 0.04
New Construction contract Total Amount	**$ 1,066,720.00**